

COMPUTERWORLD

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DP Pioneers Honored

'Technology' Questioned; ACMers Stress Service

By Thomas J. Morton
CW Correspondent

CHICAGO — The elders of the DP community were feted here on the occasion of the computer's 25th birthday last week. ACM '71 attendees confirmed that acceptance and usage of computers is growing astronomically, more than the wildest dreams of the DP innovators of

the recent and distant past, and the same holds true for the technology itself.

While some felt the future will see an acceleration of this trend, others paused to question the value of technology *per se*. "Let's sell the 'service' of computers, not the technology," they said.

Members of the Association for

Computing Machinery (ACM) want their organization to spend less time on technology and more on improving both the quality of information handling within the industry, and on the improvement of the image of the industry and of the computer outside the DP community.

Budgets a Problem

"Budgets are a main concern to the average DP manager today," a local ACM member told CW at last week's annual conference here. "Highly technological achievements developed on grants and research funds are not what we need right now... unless they are significant management tools."

Domination of ACM by the educational community is not doing the association harm, but is not helping "contribute to [ACM's] membership effectively in some particularly trying times," a Philadelphia ACMer said.

Panelists at the look-back/look-ahead sessions agreed the computer had had some problems, and one even suggested

computers gave no significant competitive advantage to users.

While the "official" attendance count varied depending upon who was asked, the ACM-anticipated 1,000 registrants came to Chicago, bringing with them enough to have the turnout called a success.

"We're getting good turnouts at the session," a spokesman said, "and both the speakers and the registrants seemed pleased with the technical program — the speakers with the attendance, the registrants with the material being presented."

Most seemed pleased with the sessions they had just attended, but did note that the tone of the speakers was different from previous years.

"There was no 'blue sky' this year," said one ACMer from Detroit.

A lady Texan said that she "got the feeling that our [computer industry] troubles are not close to being over. The brazen optimism of two and three years ago is gone."

One ACMer, from a west coast chapter, said, "I learned something here today that pays for my trip as far as I'm concerned." He was interviewed on leaving a single-paper session on user-oriented systems design.

'Service to Man'

ACM itself stressed the computer's "Service to Man" with its special events program.

Computer generated art held a prominent place in the exhibits area, as did computer generated music. The exhibits themselves — a total of 10 booths, including ACM's own — demonstrated, according to ACM, "the ways computing equipment, systems, and the people who work with them enrich and extend our lives."

The city of Chicago displayed

its center's operations in a booth with the theme "Getting it all together." Named "The mayor's data center" — to honor Mayor Richard Daley for his insistence on centralized and effective data processing, according to a city official at the booth — the center serves over 25 city departments, and through them the people of the city.

(More ACM on Page 2)



Computer users David R. Scott, left, and James B. Irwin were too busy last week to think much about the computer's 25th birthday. But they gave a good deal of thought to the computerized transportation, life-support, and communications systems on which their lives depended. (Wide World Photo).

IBM Field-Developed Programs Offered for 'One-Time' Charge

By Don Leavitt
CW Staff Writer

WHITE PLAINS, N.Y. — IBM has a new class of software, made up of semi-supported, specialized application programs available for a "one time" charge.

Unlike Program Products developed centrally to meet needs of many users, these Field Developed Programs (FDPs) are written by IBM branch office personnel to meet the needs of small but identifiable groups of users, a company spokesman ex-

plained.

Users obtain the FDPs under IBM's normal licensing agreement, but pay only for the first 12 consecutive months. After that, the terms of the agreement remain in force but charges are waived, regardless of how long the program is used.

There is no on-site installation support for these packages. IBM conducts "workshops" for each of the FDPs, at IBM-designated

locations. Users are charged a fee to attend these training sessions.

There is no "centralized programming support," as there usually is for IBM's standard Program Products. No corrected or enhanced versions of the packages are distributed as a matter of course.

IBM will distribute any "error correction information" pertinent to an FDP, but only for the

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2,210 Char/Sec for \$1,865/Mo

CDC Line Reader Uses Laser

By Michael Merritt
CW Staff Writer

MINNEAPOLIS, Minn. — The 921 optical character reader from Control Data Corp. uses a helium-neon laser to drive a system that reads 1,200 document/min and costs \$1,865/mo on a one-year lease.

The system configuration includes the reader, reader controller — a 4K by 8 bit mini — a teletypewriter, and a 7-track, 200 bit/in. tape drive and controller.

The unit can read data fields up to 80 characters, depending on font, at speeds up to 2,210 char/sec. It is designed for single-line documents, rather than pages.

Up to three fonts are available on the machine: Ansi OCR-A, sizes I and IV; Farrington 7B; and ISO OCR-B, size I. Documents can range in length from 4.5- to 9 in., and in width from 2.6- to 4.5 in.

There aren't many line-oriented optical character readers in this price-performance range. Optical Scanning Corp.'s 288B reads 375 to 1,000 document/min with 70 char/document and costs \$1,949/mo. The unit can decipher hand printing, Opscan said.

Univac's 2703, running on-line to a 9000 series computer, can read about 300 or 600 document/min and costs from \$1,050/mo to \$1,600/mo.

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Australia Has DP Job Needs At All Levels

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. — The Australian Embassy said there's a shortage of computer people "down under."

Although not specific about the number of jobs available, an embassy spokesman told CW last week he was having "no difficulty" placing Americans in DP jobs in Australia.

While there is no vacancy list, a need exists for all levels of programmers, operators, and managers, the spokesman stated.

The official explained the absence of a job listing: "We do things the other way. People interested in finding a job usually send us their job history or resume, and we forward it to the Ministry of Labor."

Applicants are then informed of any success, and could proceed to emigrate if they so chose.

As occurs with many countries seeking skilled or otherwise needed employees, Australia provides travel assistance to those willing to settle in the country for at least two years.

The Travel Assistance Program provides \$365 in U.S. funds to each member of the family (youngsters on a pro-rated basis if they qualify for reduced rates), and about 55% of the immigrants utilize it, the official noted.

The Australian Computer Society (ACS) said the most pressing needs were for experienced data processing people, "especially those with two or more years" in large-scale computers or large-scale tasks.

The largest DP employer in Australia is the government, which has large-scale installations in Canberra (the commonwealth's capital), Sydney, Mel-

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Eniac to 2001: 'Economic Payoff' and 90% Overhead?

By Alan Drattell
Of the CW Staff

CHICAGO — The past 25 years brought acceptance of the computer beyond the scope and vision of the most enthusiastic pioneers. And for users, the future looks even brighter.

Many of the promises of the 1960s are expected to be realized in the decades ahead following the near-stall caused by the current economic recession.

At ACM six computer industry consultants took a self-critical look back at the first 25 years since Eniac and warily viewed the next 25, which brings us to the threshold of the 21st Century.

Ahead, according to the consultants, are significant advances in hardware and software and business applications, and management lessons learned from the past quarter century will be applied in the next 25 years. The people problem will also be tempered.

Cautious in their prognostica-

tions, the consultants foresee less chaotic change than that which epitomized the most recent decade.

According to William J. Osterman, director of product and market planning, Auerbach Information Services, three major influences will shape the future course of computer technology. They include the continuing economic maturity of the industry and the user community. "The economic payoff has become the byword of our industry," he said.

Other Influences

Other influences are the potential to achieve significant price/performance ratios and the opportunity to bring EDP technology to thus far unexploited application areas such as urban transportation, pollution, hospitals and even into private homes.

Frederic G. Withington, senior staff associate, Arthur D. Little Inc., predicted that users might

"cheerfully (accept) software overhead exceeding 90% as the price willingly paid for a degree of adaptability, flexibility and human orientation that would be incredible today."

He forecasted that mass storage devices and wide band digital communication facilities would "add their dashes of color to the picture of the future" and stated that the data processing industry could well become more like the retail food industry "realizing economics of scale for mass products through automated agriculture and supermarket networks, but also providing a rich variety of specialty foods and services..."

Discussing business applications, Mortimer Rogoff, executive vice-president of the Diebold Group, said computers in the past forced limitations on applications and the user has had to adapt to the restrictions of the computer. He cited the examples of the airlines reservations system, the language prob-

lem and the financial executive who finds "discomfit" in dealing with his "electronic colleague."

Rogoff iterated a question asked by puzzled users: "Why can't I just talk — or write — to the machine?" The user, he said, "has been compromised because the computer's capabilities have continued to force language developments that remain restrictive from the human viewpoint."

In the future, said Rogoff, "we can look forward to much greater hardware capability the programmer must take advantage of." He anticipates penetration of the language barrier "by employing hardware language processors for conversion of (the user's) normal languages, so the user is at ease as he communicates with the processor, and the processor takes on the burden of translating into machine usable language."

Increased complexity of hardware, added Rogoff, "should give the system designer and system programmer, as well as the applications programmer, new ability to solve problems."

Harvey Golub, a principal with McKinsey & Co., said that the past has taught us that "as valuable as computers are, they cannot... substitute for good, imaginative, innovative leadership. They cannot provide (a user) a major competitive edge."

In the next quarter century he sees the computer more intimately tied to the overall management process "becoming a more integral part of top management decision making." He also foresees new organizational forms being developed.

Joseph F. Horner, director of the electronic industries program for Stanford Research Institute, said that the profile of computer

users will change at a moderate pace over the present decade.

Small businesses — having little or no experience with EDP — will seek to buy a complete solution to a problem rather than a collection of hardware. And a second type of user will also become important in the 70's: the production factory manager and his staff.

"Beginning in the latter part of the 1970's," Horner continued, "still other kinds of users will be added to the computer user profile in large numbers. New service businesses and institutional customers such as health care facilities, schools and libraries will become important segments of the EDP marketplace."

Harvey L. Poppel, vice-president, Booz, Allen & Hamilton Inc., looked at people. He said that personnel costs are stabilizing and that the quality of work is higher. "People supply," he added, "is approaching demand."

The past 25 years, overall, came in for some sharp criticism from the consultants.

In a typical analysis, Osterman said that we have "paid lip service for years to the problems of an input/output bottleneck" and a commitment to "unyielding innovation and change in the computer field has been an all too frequent failure to fully anticipate the technical and economic consequences of a given innovation or development."

And Golub described tongue-in-cheek the life cycle of a system development project going through six phases: wild enthusiasm, disillusionment, total confusion, search for the guilty, punishment of the innocents and promotion of non-participants.

DPers See Professionalism Evading Them

CHICAGO — In "The impact of professionalization efforts on the computer manager," an ACM panel discussed the growth of the computer professional and his claim for recognition.

Chairman Malcolm H. Gotterer

of Pennsylvania State University, named two conditions that had to be met for professionalization to be meaningful to the computer specialist:

"A means for certifying the professional competence of the

individual must be developed; and there must be meaningful acceptance, by both the individual and those for whom he works, of his responsibilities and obligations." But he added that he didn't see that taking place in the near future.

Heaping coals onto the fire, panelist Paul C. Notari of the Association of Computer Programmers and Analysts said the placing of control of a corporation's most vital records and functions into the hands of undisciplined amateurs was quite like giving a child an axe. "Either," he said, "courted disaster."

He said that a "rampant" non-professional attitude of programmers and analysts existed and that management had become alienated by that attitude... even though they had partially caused it by too quickly building staffs to man the "miracle machine" with everyone from accountants to truck drivers.

He said management has reacted to the lack of professionalism by EDP with fear, distrust and disfavor. When EDP personnel begin to live up to professional standards, management attitudes will change, he added.

IBM Software Bought in One Year

(Continued from Page 1)

first six months after general release of the package. After that, support ceases.

'About 24' Available

There are currently "about 24" FDPs available, according to IBM, and they cover nearly as wide a range of hardware configurations as they do applications. The latest releases, for example, are a S/3 package for brokerage houses and an 1800 package for medical history recording.

The Disk Brokerage Accounting System is used to control the accounting details of "several hundred" trades a day, including the printing of confirmations, blotters and journals. It requires a 16K system and costs \$350/mo for the first 12 months.

With the Computer-Assisted

Medical Examination System, patients use a light pen and 2760 optical image terminal to enter their history and basic data into files on an 1800. Test results can be entered directly by lab personnel. This system requires 32K words of storage, and costs \$2,400/mo.

Other FDPs previously released include a public utility financial planning system that operates on a model 25 or larger 360, with 48K core and two disks. This goes for \$440/mo for the user's first year.

A composition system for print shops runs on an 1130 and can be licensed for \$1,000/mo. This FDP is more flexible than most. It includes scheduling routines that could be adapted for use in other commercial job shops, an IBM spokesman said.

Torch of Progress Passed at ACM; 'Highly Creative Are the Young'

CHICAGO — The computer industry paused here last week in its relentless progress to mark the 25th anniversary of the electronic computer and to hand the challenging promise of the future to the younger generation.

At a dinner commemorating the birth of Eniac, the world's first electronic computer, co-inventors J. Presper Eckert and Dr. John Mauchly, were singled out for their historic contribution.

Robert E. McDonald, president of Univac, which hosted the dinner, said that "history tells us that the highly creative people in this world are the young people."

Eckert, he said, was in his twenties and Mauchly in his thirties when they developed Eniac, and then on to Univac I. "The creative insights that produce fundamental changes in the human condition are in the province of the young," added McDonald, challenging the younger generation "to help solve the problems that exist."

McDonald said that the dinner was intended "not only to commemorate the past but also to give due recognition to the future. In the name of past achievement, Univac has established the Grace Murray Hopper award to recognize the promise of future achievement."

The award, to be made once a year to a young member of the computer community, this year went to Dr. Donald E. Knuth, a professor of computer science at Stanford University.

The award is named for Commander Grace M. Hopper, (USNR, Ret.), one of the pioneers of the industry who has been described as a "woman ahead of her time" by some of her admirers.

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DP Helps Rescue Shock Victims

ALBANY, N.Y. — Seventy victims of severe injury have been saved from possible death from trauma, or shock, at Albany Medical Center because a team of physicians, college engineering professors, and computer scientists has found a way to predict and prevent respiratory failure.

The method combines electronic detection, high-speed computer analysis, and timely medical care to prevent patients from sinking into the irreversible "post traumatic pulmonary distress syndrome" or shock lung that usually causes death within two to 15 days after injury.

Patients have been treated in a specially equipped "trauma research room" at the medical center. The accident injuries involved severed limbs, internal lacerations, and head wounds.

Electronic equipment in the one-bed room is used to make periodic checks of heart beat, blood pressure and lung capacity. It was developed by biomedical engineering professors at nearby Rensselaer Polytechnic Institute (RPI) at Troy, N.Y.

This information is then relayed to a time-sharing computer at the General Electric research and development center in Schenectady. After it is stored in memory it is processed and analyzed, and the results returned to the bedside physician within minutes.

Physician Alerted

The physician is thus alerted to the symptoms of impending disaster in time to take preventive measures to save the patient's life. Treatment includes intravenous fluids and artificial ventilation of the lungs.

Programs developed and written for the trauma research project permit the computer to calculate as many as 20 simultaneous physiological functions.

"The combination of measurements, computer analysis, and timely medical attention has led to virtual elimination of death from the posttraumatic form of the pulmonary distress syndrome," said Dr. Samuel R. Powers, professor of surgery at Albany Medical College and attending surgeon at the medical center.

Very little was known about this syndrome or the methods of treatment when the project was started three-and-a-half years ago.

Dr. Powers conceived the joint program and brought together the medical, university, and industry team to do the job. He estimates that some 100 patients have been treated in the trauma research room.

"Each was so severely injured that survival was questionable," he explained. "Yet the great majority survived."

The Albany Medical Center was one of the pioneers in trauma research. Nine projects in this field are currently under way under the sponsorship of the National Institute of General Medical Sciences, one of the Federal Government's National Institutes of Health. The Albany project is funded at approximately \$150,000 annually by the N.I.H.

Although tremendous progress has been made, several problems remain. For example, data collection and analysis were done on a time-sharing computer at the GE research and development center, but a special analog-to-digital converter was required. Most commercial time-sharing computers do not have this feature.

Neither the equipment nor the computer programs were available when the project originated. They were designed or modified to fit the need through the joint efforts of the medical center staff, the RPI faculty, and GE scientists.

Computer Compiles Water Laws

BOISE, Idaho — A search by the University of Pittsburgh's computer on Idaho state laws mentioning water, dam, and irrigation has resulted in a book published by the Idaho Department of Water Administration. The \$10 volume contains all Idaho water laws and regulations of the water department.



Checking computer flow chart are surgeon Dr. Samuel R. Powers, GE scientist Dr. Leonidas J. Jones and Dr. Edward J. Smith, RPI biomedical engineering professor. The men are members of a team at the Albany Medical Center which has saved 70 victims of severe injury from possible death from trauma, or shock. When interpreted, the symbols signal onslaught of respiratory failure that usually causes death within two to 15 days after critical injuries.

Park Computer?

CHICAGO, Ill. — Would you believe there's a computer-in-the-park?

At Chicago's Museum of Science and Industry a computer owned by the Chicago Park District has been set up in a simulated atmosphere of trees, grass and picnic benches.

The computer, a Univac 9400 system, is not only an educational exhibit sponsored by the park district and Univac for visitors to the museum, but also performs DP chores for the park district.

While visitors peer through the glass enclosure to the exhibit and listen to a recorded commentary, the computer keeps track of all the equipment and services needed to maintain 500 parks and many ball fields, swimming pools, gymnasiums and bandstands in the district's jurisdiction.

It also helps control the district's purchasing and budgets.

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Voice Uses Add to Phone Study

By Ronald A. Frank

CW Technical News Editor

SAN FRANCISCO — A statewide investigation of whether data users overload the telephone network was expanded last week to include certain voice transmissions as well.

An apparent shift by the Public Utilities Commission (PUC) staff led to a recommendation last week that additional "unusual business usage" such as "poll taking, credit checking, recorded announcements, and other services" should also be examined.

The staff had originally said that telephone lines studied in the Palo Alto area were "seriously overloaded due to computer access lines." This charge together with a recommendation for an intrastate measured taxi meter rate only on data lines led to opposition from data users and forced a postponement of planned hearings [CW, March 17].

The hearings were further deferred last week when the PUC ordered the formation of a study committee to examine heavy telephone use by both voice and non-voice customers.

The original staff report cited studies early in 1970 that reportedly showed computer access lines "often have 10 times the usage of regular business lines."

In line with the staff shift away from singling out data users, a

Pacific Telephone & Telegraph spokesman said last week, "We are now satisfied that data demands were not at the root of the Palo Alto service problems in 1970."

The PUC-appointed committee will include representatives from the phone industry, large business users of data and other phone services and PUC staff

members.

Several DP firms have told the commission they would serve on the committee and major firms such as IBM and Xerox have indicated an interest in appearing before the study group.

A report on the committee's findings is scheduled to be presented to the PUC on December 8.

Honeywell Jumps Prices

Hot on the heels of IBM [CW, Aug 4], Honeywell Information Systems and Univac have raised hardware prices, becoming the second and third dwarves to do so.

The first was RCA, which was so hot on IBM's heels that it preceded the Colossus by three months.

Honeywell is raising rental rates on most CPUs and peripherals by 4%, and rentals on 6000 series and 105 model CPUs will go up 5%. Monthly charges on the 1015, 2015, 115/2, and data preparation peripherals such as key-to-tape devices, will not be changed.

Purchase prices of the 6000 series CPUs will rise 6%, and purchase prices of the 105 CPU will go up 5%.

Maintenance for most units will be boosted 7.5%.

Univac raised purchase and rentals on selected processors and peripherals by 5%, and maintenance on almost all products by 7%. There were no purchase or rental increases for communications terminals for the 1700 series of data preparation devices, however.

Univac also reduced purchase and rental on the 8414 disk drive, and pointed out that installations using a number of the drives might experience no increase in system costs. The 8414 is available for all 9000 and 1100 series systems.

Both Honeywell and Univac laid the increases to rising costs of doing business.

Aussie DP Jobs Revealed

(Continued from Page 1)

bourne and other state capitals.

Permanent appointment in the Commonwealth Public Service, however, is generally open only to British citizens. Others may obtain long-term "temporary" employment, but retirement benefits are not included.

The embassy indicated terms of government employment may be changing, but today aliens must swear allegiance to the Queen, ACS reported, thereby renouncing citizenship of their original country.

Another big computer user is the Commonwealth Scientific and Industrial Research Organization, which last year listed a prodigious computer assortment of CDC 3200s, DEC PDP-8s and 15s, Hewlett-Packard 2114As, NCRs, Novas, and others.

The research organization is independent of the government in staffing, and has no restrictions on nationality. Its demands are mainly for highly qualified graduates to work in computing research, numerical analysis and consulting tasks for scientific computer users, ACS said.

Academic vacancies exist at several universities, according to the embassy.

Salaries of DP people vary considerably depending on experience and qualifications. While about two-thirds of those in the DP field make between \$4,000

and \$7,000 a year, ACS said, the Australian dollar is worth more in actual exchange and use.

While some people use a formula of multiplying an Australian salary by 1.5 or 2 to obtain an equivalent U.S. salary, ACS cautioned this should not be taken as "more than a guideline."

ACS said 35% to 55% of Australians engaged in systems and programming belong to the society.

Nearly all U.S. manufacturers have users in Australia, and most of them also maintain support for marketing, customer education, support, and software.

Of the U.S. computer companies "down under," ACS listed IBM, Honeywell, NCR, DEC, Burroughs, CDC, GE, plus England's ICL.

The society suggested that the manufacturers' in-country branches might be able to advise if some of their clients are currently seeking staff with prior experience in the use of particular computer equipment.

The Embassy said regional consulates would provide additional information. Parties were informed to consult telephone directories in San Francisco or New York for those consulates, or the Embassy itself in the Capital.

Additional consulates will be opened before October in Chicago and Los Angeles, the official related.

CDC Reader Uses Laser, Mirror

(Continued from Page 1)

The beam from a 1 mW continuous laser, operating at 6,238 Å, is sent through a beam expander and aperture to insure uniform intensity, and then to a spinning mirror.

The mirror directs 95% of the beam's light onto the document, reading the characters by col-

umn scanning.

The mirror spins at 4 kHz, giving 68,000 column scans a second.

The laser reader can interpret degraded print well, CDC said. Output is placed on magnetic tape.

Purchase price for the system is \$24,500.

News Wrapup

RCA Delivers 2s on Schedule

MARLBORO, Mass. — Deliveries of RCA's new series of computers have begun on schedule with installations of RCA 2s at Reader's Digest Inc., Pleasantville, N.Y., and the southern region marketing sales office of Gulf Oil Co. in Atlanta.

When RCA announced the line, the RCA 2, 3, 6 and 7, last September, it said deliveries would start the third quarter of this year. Reader's Digest is using its system to control peripherals used in addressing bills and other documents. Gulf will use its RCA 2 for sales analysis, inventory control and general accounting applications.

NAS Names 14 to Computer Science Board

WASHINGTON, D.C. — Fourteen new members have been appointed to the Computer Science and Engineering Board of the National Academy of Sciences. They are: Stephen Ailes, Lewis S. Billig, Howard Campaigne, Fernando J. Corbato, Harvey Cragon, Guy Dobbs, Hugh Donaghy, D. Brainerd Holmes, Wayne D. Holtzman, Cecil E. Leith Jr., Donald A. Lindberg, Max V. Mathews, George A. Miller, and Robert J. O'Keefe.

The board members discuss the general status of the field and analyze current activities and future priorities in areas of education, research and development, national programs, and compilation of data.

Disk File Pioneer Retires From IBM

LOS GATOS, Calif. — Reynold B. Johnson, leader of the initial disk file development effort, has retired from IBM.

Johnson began work on direct access storage products in 1952 when he established IBM's San Jose laboratory. The firm's first disk file product was the IBM 305 Random Access Method of Accounting and Control (Ramac).

Urine Data Bank Seen Aiding Addict Policy

WASHINGTON, D.C. — A proposed national computerized drug data bank would give the government a basis for formulating addiction policy, according to Dr. Lawrence V. Vineburgh, trustee for the Washington Reference Laboratory.

In making the proposal, Vineburgh called for all federally funded laboratories to contribute to the information pool. Through a urinalysis, such as those performed by the Washington Reference Laboratory, the content and quantity of dosages may be identified.

"By putting that into the computer you would be able to observe what new drugs were being taken and in what combinations, and where."

Lykos Named to Computing Post at NSF

WASHINGTON, D.C. — Dr. Peter G. Lykos has been appointed program director for special research resources in the Office of Computing Activities of the National Science Foundation. His activities will concern development of computer-based techniques for scientific research and studies on the impact of the computer on society. Lykos is presently on a two-year leave from Illinois Institute of Technology.

System to Help Police Link Crime Patterns

LOS ANGELES — The Police Department here has unveiled a prototype computerized information system designed to help officers pinpoint developing crime patterns and link related crimes.

The Pattern Recognition and Information Correlation (Patric) system, developed by System Development Corp., will undergo tests for eight months.

A detective using Patric queries the system about a particular crime and compares the details with all other similar crimes in the city.

Polish Officials Hit DP Underutilization

WARSAW, Poland — The underuse of computers in Poland has become a concern of this nation's economic planners, who are striving to maximize the return on new investments and utilization of existing resources.

Most computers installed in Poland are not used, and those that are used are serviced by inadequately trained employees, decried a recent Warsaw Home Service broadcast.

Sharing Building May Benefit DP Facilities

GREEN BAY, Wisc. — Locating the computer facilities of two firms in the same building is expected to provide each with added backup protection and greater flexibility in servicing customers. The DP centers belong to The Kellogg Citizens National Bank and Green Bay Packaging, Inc., which will also locate its accounting department and corporate staff in the building. The firms presently each use a 360/40.

N.Y. Police Thought They Seized Computer

NEW YORK — Press reports here last week cited a raid by local police on a gambling headquarters. Among the equipment seized by arresting officers were several office machines and a "computer."

After calling in experts to identify the confiscated equipment, which an officer described as "something new for us," the CPU turned out to be an ordinary calculator.

In addition to the standard arithmetic functions, the device was able to perform square root problems, a NYPD source told CW.

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Star-Spangled Send-Off

By Don Leavitt
CW Staff Writer

WASHINGTON, D.C. — The "neither rain nor sleet nor . . ." service has some software it wants to give away. The U.S. Postal Service has arranged a one-day symposium to be held here Aug. 26 to describe the wonders of the new package. Four volumes of documentation have been published by the Government Printing Office.

The symposium announcement said, modestly, that the new system, which can run on CDC, Univac or IBM CPUs, has been acclaimed as being "as significant as the introduction of atomic energy in the energy field." To get the session off to a good start, a military band will provide "opening music" at 8:30 a.m. and will play the national anthem after a formal call to order and presentation of the colors.

The system that brought on such a massive effort of publicity, and accommodation to potential users? It's an energy requirement analysis that calculates heating and cooling systems for buildings. More information about the package or the \$25 symposium including coffee, drinks and lunch is available from the Post Office Department, Bureau of Research and Engineering, 20260.

To Test Technology

Systems Approach Suggested for Town

CW Washington Bureau

ANNANDALE, Va. — An independent consultant here has recommended to a number of government and private agencies the construction of a new city that will utilize a systems approach to urban/environmental technology development and testing.

Camp A.P. Hill, an underutilized federal military installation near Fredericksburg, Va., would be the site for "developing a unique and composite urban system," according to Robert G. Smith, president of Innovative Systems Inc.

The system, he explained, would consist of an experimental new town, an urban/en-

vironmental research center and test facility.

The primary emphasis in the new town, related Smith, will be "on the conduct of urban and environmental research and development, testing and experimentation and the direct application of the resulting technological, social and economic innovations at the site and in other new towns under construction throughout the nation."

Should a problem arise such as in street maintenance or garbage collection, citizens could feed their complaints to neighborhood urban planning technicians who could relay the data to a computer for a solution.

The planning and construction of Camp A.P. Hill as a new town

"must be carried out within the context of an overall development cycle that is comprised of a series of basic but related functions including input, planning and management, output and feedback," he said.

The input function involves the evaluation of data on external factors such as business conditions and population characteristics, and internal factors such as land use pattern and management structure.

The planning and management element is comprised of planning and development and economic model design and simulation.

The output function, a byproduct of the overall planning and management element, according to Smith, consists of quantitative data that can be defined in terms of the new town constructed, number of people housed, the new environment created and jobs created.

The feedback mechanism, along with the economic model, is used primarily for updating, correcting and monitoring the overall planning and management of the new town as it moves from concept, through planning and development, to maturity.

Drug Data Bank To Disseminate Medical Writings

By a CW Staff Writer

PHILADELPHIA — While computer experts are seeking ways of using the tools of their trade to help combat the drug problem, a local company has found at least one: a data bank of the latest scientific writings on the subject.

Last May, Information Inter-science Inc. (3i) completed its research and began making the results available to the medical/scientific community. The results are standard 3 in. by 5 in. index cards, one for each article stored in the computer, an IBM 360/40.

The cards contain the key word (such as "cannabis" for all articles dealing with marijuana), the title and author of the article, the author's credentials, the source, a medical indexing of chemical structure of the drug, cross-indexing by symptoms and adverse reactions, plus control data for the company's internal usage.

Abstracts are provided when requested, a spokesman said, and the company keeps microfiche copies of the writings, so complete hard copy can also be provided if necessary.

The service will also be made available to other interested parties, including law enforcement officials, said Arthur Haines, manager of 3i's Scientific Information Center.

The monthly listing costs \$52 for a year's subscription, and according to Haines, over 3,500 biomedical and chemical journals are consulted.

Haines said it might be possible to transmit the data over time-sharing terminals, although "we're not programmed for that as of now."

Control Data announces new laser beam optical character reader

Reads degraded print
•
Faster throughput
•
Low cost

Now, for the first time, even data processors with limited budgets can sidestep costly card punching, reduce paper work and cut the risk of human error. Control Data has put the laser beam to work to produce today's lowest cost line of Optical Character Readers (OCR). Units capable of reading even degraded print.

Breaks the \$2,000 system barrier

For years OCR has saved substantial time and money for big EDP users. Priced to lease at under \$2,000 a month, these new CDC units now make the same economies available for many

more applications: retail stores, service bureaus, financial institutions, insurance companies, government organizations.

Reads up to twice as fast as other OCR units

The new Laser Reader processes 1200 documents a minute. It can be equipped for reading any of three different computer fonts. Handles anything from imprinted credit card documents to turn-around billing documents; accommodates sizes up to 4 1/2 by 9 inches.

The new OCR unit is complete in itself; data input is instantly recorded on magnetic tape without need to tie up a central computer

system. Control Data also will design and print forms tailored to insure optimum data conversion results from the start.

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Control data supplies OCR systems to meet virtually any performance or budget need. Offerings include a versatile combination page and document reader. A unit which reads 90,000 documents an hour. A low-cost reader that can replace up to 90 key-punch stations. And a super-scale system which supplies all necessary input for a data base of 50 million records!

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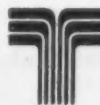
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Editorial

Revolutionary Progress

The 25th birthday of the electronic computer was celebrated last week with a black-tie dinner and an afternoon of critical discussion at ACM '71.

But three of the world's most dedicated computer users weren't present. Astronauts David R. Scott, James B. Irwin, and Alfred M. Worden were 250,000 miles away, orbiting the moon.

If computer technology has stumbled a bit during its infancy and its youth, the fact that it has already put men on the moon is breathtaking evidence of its leading role in the future.

People don't talk much about the "computer revolution" anymore, perhaps because computers didn't fulfill their advance billing fast enough to satisfy the man in the street. But "revolution" (a radical or complete change) is the word historians will be using before the computer's 50th birthday.

Indian Giver



Letters to the Editor

User Realizes Benefits From Using Sort 483

I have been following the hot Sort 483 debate for some time now, and feel that I must speak up in its defense [CW, June 16].

Like many other users, we converted to Sort 483 for the sake of 2314 support, but then we came to realize its many other benefits, which to me seem to overshadow any advantage which Sort 450 offers.

We didn't run any benchmark studies or any other "scientific" comparisons since we had no choice about the conversion, so I do not have any figures on actual timings.

However it did seem at the time that we realized an improvement in run time;

probably the difference was due to the 2314s themselves.

We are running on two 360/40s and a 360/30 and generally allocate at least 32K to a sort partition. The files, as a maximum, would not exceed 130,000 19-byte records, of which 10 bytes would be control information.

But I spoke of other benefits. To simply itemize:

- Self-relocation, both of the sort and user exits, thus avoiding cataloging exit modules at specific addresses, which would have to be given in parameter cards (the problems get complicated in a multi-system, multiprogramming environment)
- Much more logical communication between the sort and user exits — more consistent with intermodular linkages and much easier to use

• The Exit option allowing the user to read his own input and/or write his own output (if Sort 450 had that, then it would support 2314s indirectly)

Thus it is possible to sort an Isam file into a different sequence and to make one program out of a pulloff-sort-list trio

• Ability to write all exits into one program which would load and call the sort — beautiful for operator transparency, which, sad to say, is a need

• The user manual for Sort 483 is much clearer, more concise, more complete, easier to read — the description of user exits in the Sort 450 manual is garbage.

We, as a user, consider these things important, because they help us get the job done — better.

Jerome P. Gonella
Systems Officer

The Central Trust Co.
Cincinnati, Ohio

Sort 450 Support Asked

I would like this letter to be considered as part of the needed demand for support on the Sort 450 if the necessary support is available for our installation and there is a definite "performance edge."

As most of our sorting is done in a 52K partition (either background or foreground), at what core availability does performance generally become a break-even proposition with Sort 483, and will the Sort 450 be relocatable? One final question: Will it be able to support the 2314 direct access device?

L.J. Lewandowski, Mgr.
EDP Department

The Bostwick-Braun Co.
Toledo, Ohio

Key to Professionalism Seen in Pruning Staffs

I have observed with some interest the efforts of Alan Taylor to start his exclusive CDP club. I get the implication this organization will appeal to some sort of snob group, that is to say, you aren't worth a damn if you don't have a CDP.

I have drifted away from programming as such into the educational area, and I have never really investigated the CDP exam. Perhaps I am speaking without proper knowledge, but bar exams have not eliminated incompetent lawyers, state board exams have not eliminated incompetent physicians, and the CDP exam will not eliminate incompetent programmers, analysts and managers. In fact, it really only indicates an ability to study and

remember facts for an examination, nothing else.

The real key to professionalism in DP is for companies to just simply remove those people who can't, or won't, produce results. The ones who remain will automatically be the professionals.

It is, after all, results that count, not initials after your name or fancy certificates on the wall. I wonder how many CDP holders stole the study time for the exam from their respective companies, when they should have been producing a truly workable system, seemingly a rarity these days.

Howard B. Millen
Fort Lauderdale, Fla.

Education Exemption Wanted

I was a charter member of NMAA which subsequently became the DPMA. However, I dropped my membership some six years ago because I was not at all satisfied that the time and effort was worthwhile. I specifically declined to participate in the CDP examination because I didn't believe it was worth the paper it was printed on.

Now I think the time has come when we can justify the creation of a formal organization that recognizes and promotes the certified data processing professional.

In the event that such an organization is founded, I will be the first to apply for the certification examination. However, I wonder if I will be excluded because of the lack of a college degree.

Would it be too difficult to establish an education exemption based on age and accomplishment, that would have a time limit? And such an exemption could be allowed by a local board of review?

The point is that there are many of us lacking a formal degree but certainly qualified by experience and training. To exclude such individuals from certification would deny recognition to some of the most capable people in our field.

Donald E. Nelsen
Stephens-Nelsen Computer Center
Spokane, Wash.

Taylor replies: Currently the request is premature — but hopefully we will be able to take it up soon.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

DP Security Needs Not Unusual

By James H. Johnson

Special to Computerworld

The concept that physical security must be tailored for a computer center is a myth. Scare tactics are used to exploit the corporate executive and the glamour of EDP to sell expensive equipment which may not be justified.

Except among the more alert business executives, many are accepting stories of losses and grandiose promises of security without questioning the authenticity. "Wave a magnet in front of a tape and wipe it out," was a caption in a prominent newspaper. It is not true, but what executive questioned?

The executive cannot accept the noise, initiate security programs, and move busily on without investigation and control. What is the answer?

Select two security firms having local sales and service to bid on conducting a security study, if you do not have a security officer. Have each firm prepare a report giving a security plan, a recommended list of suppliers for each item recommended, and an estimated cost of the complete installation.

Prepare a list of equipment and submit this list to all the suppliers listed in the study report for a competitive bid. Upon receipt of the competitive bids tabulate the results and select the most economical combination.

Very few firms have the capability or the resources to evaluate all types of security equipment. Only larger firms

could justify the economics. If a firm claims this capability, a trip to that laboratory may prove very enlightening.

Recognize that danger begins on the outside. Explosives can be controlled by guards, fences, or remote warning devices.

If access is limited and controlled, only known personnel should have access to the data center. Access to the data center

Viewpoint

or other areas within, such as the library, should be on a need-to-know basis.

Begin by removing all identification marks from the center. Install the access control devices recommended. Conduct personnel background checks on persons in critical areas. Minimize entrances and remote monitors.

Unless the security firm is well known, you may question the background of the personnel performing your consulting, or managing the firm. Your security depends upon it. Can you afford not to, if you expect to dispel the myth.

A closed circuit TV system performs the same in an alley as in a data center. An intrusion alarm detects intruders in the data center or department store. Physical security for computers does not require any knowledge of EDP or EDP specialization. Physical security is simply physical security.

J.H. Johnson is a security consultant from Centerville, Ohio.

Reader Takes the Ball

Standards Thoughts: Why Does Output Need Coding?

Many people write a few comments on some of the various standards that have been suggested here [CW, June 2], but few undertake the job of commenting upon all of them. Even fewer do a good job when they comment at length.

One of the people whose comments are always valuable and interesting is W. Leon Sanford Sr., of Touche Ross & Co. in St. Louis. He actually suggested one of the standards in the first place, and now has commented upon the set of eight.

Under the circumstances I feel that the best thing I can do is to let you have his comments — so here they are.

Incidentally, I like them, but I would like to know some more readers' ideas.

No Coding for Consumers

I agree with Winstandley that when coding is used it should be intuitively meaningful (Rule No. 3), but I cannot think of a logical reason to use coding on output generated for the consumer. Even intuitively meaningful coding should not be used at

all on computer output for consumers.

It is always simpler to eliminate entirely all codes and the associated legends for their interpretation from the printed form, and to insert the complete description of codes that apply to this customer for this period in place of the jargon required to interpret any set of codes.

This technique virtually always produces documents that are easier to read than they would have been with a set of codes to be interpreted.

The reason for using codes on output has not existed since the computer came into prominence. The coding of data for outputs started in the days of tab equipment because:

- The 80 column card simply

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

never had enough columns to carry the necessary coded data, much less the descriptive information itself.

• Tab equipment did not have the ability to translate codes to their descriptive meaning for output reports such as is easily done with tables on today's computers.

The use of coding is just as valuable today as it ever was for other reasons, but with com-

puters and their ability to handle tables it is absurd to give the consumer a code that he must decipher through a table.

Freezing Rates

The concept of freezing interest rates on contested bills (Rule No. 5) should be expanded to include an ability to freeze (or completely reverse) any data that is automatically generated by the computer.

The calculation of interest as noted by Jones is an excellent example of a computer-generated number that, once gone "haywire," is compounded by the "computerized" system.

I could not agree more with the standard of providing easy input for contesting records (Rule No. 6). One thing I would add is that the automatic system should notify the user that it is aware he is contesting the record and that the matter will be resolved as quickly as possible.

The system should also refrain from sending any derogatory messages to the consumer while the record is being contested. In fact any time the computer produces derogatory messages they should never be mailed until approved by a human.

"Variables used should be understandable" (Rule No. 7) to: "Any document should be readable and understandable on its face."

Any reasonable prudent individual should easily be able to identify:

- Who the bill is from
- Who it is for
- What the bill is for
- How any service charges were calculated
- What the consumer should do once he has the bill.

Validation Should Be Easy

Numbers such as new balances or finance charge amounts are not understandable on their face and therefore the systems designer is obliged to make it easy for the consumer to validate such numbers.

For the finance charge the consumer must know the rate(s) and balance(s) used and for new balance it is always necessary to know old balance plus purchases less credits.

In essence any number generated as a result of manipulation of other factors must have additional explanations when displayed for the consumer.

In my opinion the standard, "(People should) respond from reason not fear" (Rule No. 8) should be phrased: "The automated system should respond from reason."

Dr. Herwitz has an excellent

Sanford Restates Standards

No.	Suggested Standard	Restatement
1.	Check Input Validity	None
2.	Check Output Validity	None
3.	Coding Should Be Intuitively Meaningful	Coding should not be used on outputs except when absolutely necessary — then it should be intuitively meaningful.
4.	A Bill Should Be Payable (complete, accurate, and easy to understand)	None
5.	Freeze Interest Rates on Contested Bills	Automated systems should be designed with provisions made for easily overriding any "computer generated" data just like any other type of data.
6.	Provide Easy Input for Contesting Records	All automated systems should be designed to hold contested records in limbo and notify the consumer.
7.	Variables Used Should Be Understandable	Any document should be readable and understandable on its face.
8.	(People Should) Respond From Reason Rather Than Fear	The automated system itself should be designed to respond from reason.

point, but computer systems (particularly those generating information for consumers) can, and should be, designed so that they provide two-way communication with the consumer.

• The computer should always acknowledge that the consumer has communicated with the system (particularly where the consumer was upset).

The computer could easily have available a set of various messages to be triggered as responses to various types of user contact.

• Such responses should be expedited, perhaps air mailed or sent by special delivery, to show that the automated system feels

the customer is important.

• One thing that really frustrates consumers is that the computer just ignores their pleas. The undue "past due" notice is followed by a second, a third and seemingly endless string of further abuses.

Why can't the automated system first recognize that it (or someone feeding it data) has erred and then apologize to the consumer for the mistake?

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Taylor Thoughts

A beautiful piece of arrogance is the way that holes are punched in the Veterans Administration Certification of Attendance for courses leading to a standard college degree.

The back of the punched card is printed right over the positions of the punch holes, so the holes can make it impossible to read the warning that the card must be sent back.

This will be rather unfortunate, because if the card is not returned, not merely will no further payment be received, but the veterans will not be allowed to re-enroll under any VA program, and may be required to repay all the amounts that they have already received!!

This is carrying "do not fold, spindle or mutilate" to a ridiculous extent. (Incidentally, I wonder if when the Budget Bureau approved this form (No. 76-R0405) it was aware that holes would be punched all over it? Or doesn't it care?)

Actually the Veterans Administration computers seem to have things their own way. Apparently if a card is not received, the computer automatically suspends any further payments. The VA does not bother to send out a notice.

Dan C. Winters, the director of the computer center at New York City Community College, tells me that on querying this weird procedure he was told, "The computer does not work that way." Interesting, eh?

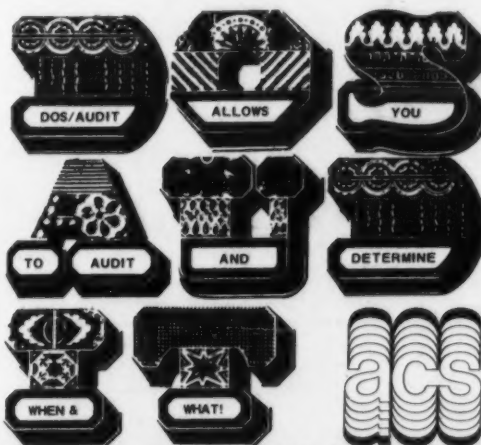
A delightful computer-generated letter was passed on to me by Howard Matthews III, associate development director of AFS international scholarships. It was addressed to Dear Mr. "Iii," and talked about the "Iii" family, etc.

Amazing that such a standard American abbreviation should have escaped the attention of our letter writers. Perhaps none of them have longstanding family names.

A new idea about the paper pollution problem came in from the Framingham firm of Perini's, where John Hays and Ed Lipchur started a good and apparently practical technique. The idea is to get the paper, and cards, back for recycling. The technique is to use a centralized dump-off point at a local computer manufacturer's branch office — in this case NCR's.

Because of the close communications that exist it does not take too much to organize the pickup. The main thing, John tells me, is to establish that the operator folds the paper in the boxes, without the carbons, as a matter of normal operations.

Once the paper gets thrown into a barrel, of course, there is no chance for recycling. The point looks like a reasonable one to me, so I will pass the tip on for other people to work with.



ASSOCIATED COMPUTING SERVICES, INC.

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ACS announces a new software package for IBM S/360 DOS which provides the user with control over his Core Image, Relocatable, & Source Statement Libraries. This is called DOS/AUDIT and provides:

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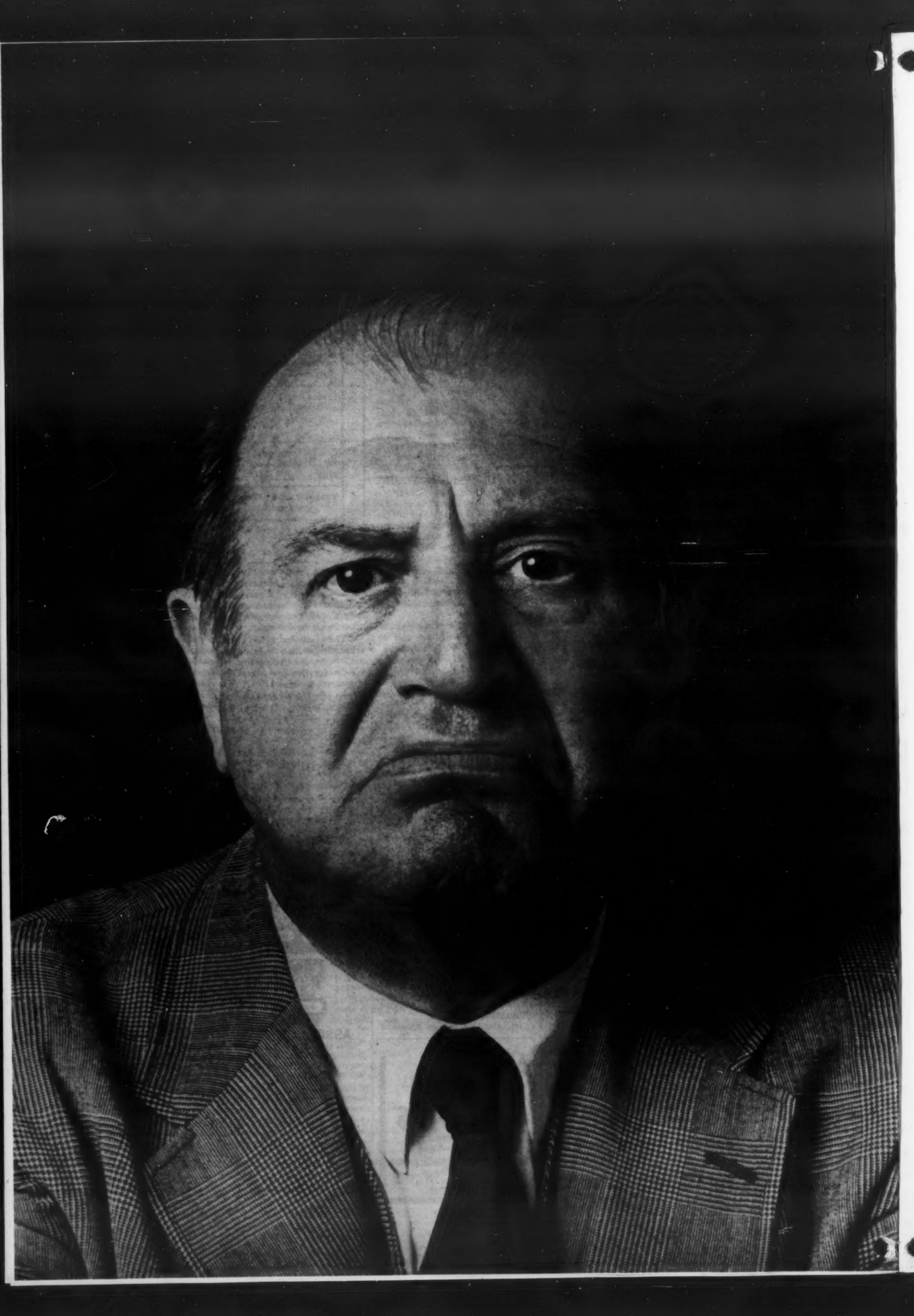
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Acronyms Set Straight

By a CW Staff Writer

Acronyms, by John P. Tutunjian, P.O. Box 93, Jericho, N.Y. 11753, 44 pages, \$2.

The woods of computerdom are infested with acronyms and initials. And it always seems that the ones you know are spelled out in first reference and the ones you don't know are never spelled out.

This second and twice as comprehensive edition of *Acronyms* (the first was published in 1969 by Computer Guidance Corp.) serves as a handy translator that may save you hours of nail-biting.

APL Volume Also Includes Fortran

By Bernard J. Luskin and Monty Ruth

Special to Computerworld

APL Programming and Computer Techniques, by Harry Katzan Jr., Van Nostrand and Reinhold Co., New York, 1970, 329 pages, \$13.50.

The fundamentals of data processing, including Fortran and APL programming, are covered in this book.

After touching lightly on DP

functions, number systems, coding and data organization, including definitions of such items as monadic and dyadic operators, the author provides a definition of computer programs and the concept of an algorithm. But with half a chapter devoted to flow charting symbols, the coverage of programming and programming languages is rather limited.

A functional description of the

computer hardware is apparently written for the computer novice.

The use of APL is expanded in a brief introduction to the language. In addition, the concept of time-sharing and the use of remote terminals are presented in a comprehensible and concise manner.

The author gives about 15 illustrations to support his brief discussion of APL statements and systems commands.

The student is provided with numerous examples illustrating operations on arrays. For the student who has access to the APL system, Chapter 5 could be used as a reference and study guide to acquaint him with the

Book Reviews

powerful APL language.

APL defined functions, statements labels, branching, input/output and the syntax of function definition are illustrated with about 50 examples which are rather elementary in nature.

An outstanding summary of operating systems is provided.

The last 16 pages of this APL book, however, are devoted to promoting the Fortran language.

Bernard J. Luskin is vice-chancellor for educational development, and Monty Ruth is learning systems programmer at Coast Community College, Costa Mesa, Calif.

Language View Treats Concepts

By Oscar Firschein

Special to Computerworld

A View of Programming Languages, by B.A. Galler and A.J. Perlis, Addison-Wesley, Reading, Mass., 1970, 282 pages, \$12.95.

This is not a how-to-do-it book in programming. Instead it deals with programming concepts.

Designed for a second course in computer science at the graduate level, the book assumes the reader has written and successfully executed several programs in a high level language.

The first three chapters deal with Markov algorithms; languages for computational algorithms; commonly used data structures and their properties.

The last chapter develops an approach to modifying and extending a higher-level language such as Algol using "extension by definition."

The book is a sophisticated treatment of programming languages.

Oscar Firschein is a member of the Information Sciences Laboratory, Lockheed Research, Palo Alto, Calif.

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Random Notes

**Dedicated Fee Cut 33%,
Other SBC Rates Unchanged**

WHITE PLAINS, N.Y. — Service Bureau Corp. has reduced by 33% the dedicated line service fee charged to large time-sharing customers. Typically, the dedicated line charge, which substitutes for the \$11/hr connect time charge, ran about \$1,375 a month, IBM said. The new price is about \$925. Storage, CPU time, and regular hourly connect time remains the same.

**PDP-15 Users Get New Fortran
With Features for Business DP**

MAYNARD, Mass. — An improved version of Fortran IV that can execute some programs 11 times faster than the previous Fortran, is available to PDP-15 users from DEC.

The new Fortran includes expanded I/O format capabilities, and extended subroutine and function capabilities, all said to be particularly suited to commercial DP operations. The new Fortran requires 16K words of memory and a disk. It is available as part of the DOS-15 operating system.

**Pert Analysis Done on Minis
With Modern Data Package**

SANTA ANA, Calif. — Minicomputer users can plan and manage their project work schedules, with Modern Pert, from Modern Data Systems Inc.

Modern Pert provides all the usual analysis based on data from a Pert network design, but doesn't have all the bells and whistles that users of full scale CPUs might be able to get from other packages, the company said. It is, however, coded in ANS Fortran and provided in source language, so it could be used on any CPU that supports Fortran. It is available for \$550, from 1505 East 17th St., 92701.

Beta Software Eases COM Work

NEWTON, Mass. — Two sets of programs from Beta Instrument Company allow users of the company's computer-output-microfilm to concentrate on their application program coding without concern for the COM interface.

The Integrated Graphics System includes subroutines that instruct the user's CPU to create graphic orders to be transmitted to the COM via a tape file. The Meta Language Processor resides in the COM unit's minicomputer and creates the output on film based on tapes generated by Fortran, PL/1, BAL or any other OS/360 compatible language. Beta is at 20 Ossipee Road, 02164.

'Martha' Analyzes Circuits

TRENTON, N.J. — Users of IBM 360 APL can analyze several linear electrical networks at the same time with Martha, a group of programs from APL General, Inc. The user's manual that describes the programs is available separately for \$6.95 from the MIT Press, Cambridge, Mass.

The programs are said to analyze, as a function of frequency or any circuit parameter, "transmission-type networks having an input and an output. This includes filters, amplifiers, microwave networks and feedback systems. APL General is at 433 Latona Ave., 08618.

Optimized's 'Optimize'**User Tunes OS/360 Operation to Needs**

By Don Leavitt
CW Staff Writer

ANAHEIM, Calif. — IBM OS/360 users may be able to improve their operations as much as 30%, with the Optimize monitor package from Optimized Computer Systems (OCS). Improvement is about 10% for most users but has been three times as much in some cases, the company said.

Optimize monitors the I/O operations controlled by OS/360. It does not consider the logic of the user's application programs. The reports generated by the package tell the user how to arrange his system to reduce I/O wait time.

By cutting into that overhead figure, Optimize allows the user to reduce overall CPU time for the same workload, or to add to the workload handled in the same amount of time as before optimization, a spokesman suggested.

Optimize reports identify the most heavily used data sets and data set numbers. The system shows how to reorganize data sets on the disk packs to reduce seek times.

The monitor also determines the optimum size for the SVC transient area. Based on actual usage, it lists which supervisor routines should be core resident and which should be handled through the BLDL table.

Single Package Concept

Optimize includes data collection and reporting in a single package so that the results of the monitoring are printed as soon as a job stream is completed without having to load a separate print utility run.

The package can be used in a variety of OS environments. Written in BAL, it requires 30K bytes of core and will run on MVT or MFT. No changes are needed to use the system on ASP or Hasp system, an OCS spokesman said.

Optimize will run on Model 40 and larger 360s, and on 370s.

The package sells for \$1,400 and OCS provides assistance in the installation and use of the package. Complete documentation is included. The OCS mailing address is P.O. Box 6372, 92806.

**Library Control System Catalogs
DOS JCL Procedures on Disk File**

SOMERVILLE, N.J. — The principles of the OS/360 Procedure Library for the cataloging of JCL job streams onto a disk file are available to DOS users through the JCL Library Control System (JCL/LCS) from Western Reserve, Inc.

A procedure library is a higher level

library than the standard DOS source, relocatable and core image facilities, according to a Western spokesman. This level contains groups of JCL statements, called procedures which may contain one or more jobs or job steps.

Procedures may be used effectively where a second card reader is unavailable for job control in a second partition. They are also useful when job activity is highly repetitive, and when a specific job sequence is required.

Executing procedures is said to provide better control of job streams than providing decks of JCL cards to the operator. In a card environment, temporary changes can become permanent modifications if the operator forgets to pull the patch card.

Temporary modifications to the procedures controlled by JCL/LCS can be made at execution time through the console. These changes do not affect the standard job stream in the Procedure Library, however, and it remains as originally cataloged.

There is no provision, in fact, for revising any of the cataloged procedures on an item-by-item basis.

JCL/LCS costs \$1,200 and uses less than 2K of core. Western Reserve, Inc. is at 4 Columbia Drive, 08876.

Package 'Maps' Company Projects

NEW YORK — The Management Analysis and Planning System (Maps), from Vital Computer Services International, is an administrative control, project control and cost accounting package that operates under either DOS or OS/360.

Developed originally for control of DP operations, the package can be user-adapted to suit any industry. Key to the system are a set of "tasks," which are the smallest usefully definable step in any project. These tasks can be peculiar to DP or to any other business.

Along with the definition of tasks, the Maps Parameter file includes cost, time and other elements that are peculiar to the using company's method of operation, regardless of the work being done.

The system works with employee time sheets, and project phase and employee

files. Optional input includes time plans and cost plan information and actual cost figures.

Maps generates management reports showing, overall, what projects are currently underway. Project managers receive reports showing how well the projects are doing and accountants get data on how much they are costing.

Exception reports identify those projects that are in trouble, either because they are behind schedule or over budget. Manpower loading reports are produced for 12 months, for planning purposes.

The system is written in Cobol and uses 40- to 50K partition, a disk pack and two tape drives. It is available under perpetual license for \$6,000 from 18 East 41st St., 10017.

**'Jasper' Taps DOS Release 25
For Job Accounting Statistics**

NEW YORK — Although IBM included a Job Accounting module in DOS Version 25, the company did not provide the coding necessary to access, store, retrieve and process the data. Jasper, the Job Accounting Systems Programs for Evaluation and Reporting from Datachron Corp. provides this support.

For each job step, a record is created in IBM's Job Accounting table which is transient. Jasper accesses this table and stores the record in a reserved area on disk. Each day Jasper recalls this data and prints a log of all computer activity.

Jasper also compares the performance of each run against its own average performance, and flags those jobs that were not within acceptable limits. Each week, the system recalculates the average for each run so the daily comparisons are made against currently realistic figures.

Shows Operator Performance

Datachron's system prepares a daily exception report of jobs that ran into difficulty, and a summary of operator performance by shift. A weekly analysis of operator performance could identify continuing trends not apparent in the daily report.

Each day, Jasper graphs partition and peripheral usage, by shift. Weekly summaries of these graphs are also provided.

A weekly report groups jobs by their general characteristics. This would allow the user to select jobs with complementary requirements for an effective multi-programming mix, Datachron said.

Jasper costs about \$2,500 and is available now from Datachron, at 174 Fifth Ave., 10010.

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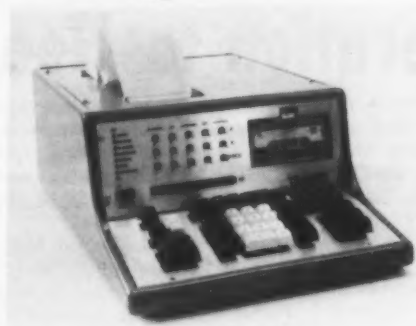


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Formal Request, Review of Proposals Eases Evaluation of DP Consultants

By Bruce H. Frank

Special to Computerworld

In the last several years, the use of consultants in the computer industry has increased and the questions of how to select and deal with them has become extremely important to those involved. Unfortunately, many people in the industry are novices in dealing with outside contractors.

A person who wishes to buy consulting services must detail, to the consultants he is considering, both the work required from them and the terms and conditions of purchase of this work. This should be done in the form of a request for proposal.

These requests should contain the technical specifications for the project, and items such as:

- The acceptance criteria (what the judgment of acceptance of the final product will be based upon)

- Requirements of documentation required from the consultant

tant

- The computer data requirements, (for example: When a problem develops in running on the in-house computer, what is the judgment as to whether or not it is an equipment problem or software problem?)

- The required schedule

- The form of contract which the client expects to issue — fixed price, cost plus fixed fee, time and materials, etc. if the client has a preference

- The ownership of proprietary data

- Who is the key person to communicate with in the company.

In addition to the above, the contents of the required proposal should be stated so that the client will receive proposals which can be compared easily.

Some of the general sections of the proposals, which should be required, are:

- Technical approach

- The experience of the company on similar projects

- The key personnel who will be assigned to this project (rather than the key personnel in the company)

- The facilities that will be used: Will they be at the client's facilities or the consultant's facility? Would the client's computer or the consultant's computer be utilized?

- The time plan which the consultant proposes, in more detail than the schedule which has been given to him

- A breakdown of all the various tasks involved

- The costs of the project

- The alternatives, if any, which the consultant proposes to the approach which the client has specified as a technical specification.

In analyzing proposals, it is imperative that personal bias be kept to a minimum. More than one person must be assigned the task of reviewing proposals and this review must be done independently, each person working by himself. The reviewers should be given a set of "ground rules" for evaluation, so that they can attempt to quantify their evaluations.

Prior to receipt of the proposal the client should do an analysis of what price and schedule it would be reasonable to expect from the contractor. In this way, a "red flag" can go up when either factor is significantly less or more than the estimate made.

Parameters

Otherwise, the client can develop a worksheet showing the maximum score a reviewer may give each of the parameters of technical competence, technical

approach, the management approach, the similar experience of the consultant, his schedule, understanding of the requirements, and responsiveness to the work requested of him.

Although one reviewer may differ with others, item by item, he would be consistent in his own scoring since he is evaluating all of the proposals submitted.

Proposals Ranked

The total score given a proposal by a reviewer determines its rank among all the proposals. Comparing ranks determined by this method, we have found an

Analysis

amazing consistency of results from reviewers working independently of one another.

Once the client has the ranking, based on everything but price, he can examine the pricing. Sometimes he will find that one bidder who he considers third in terms of competence has the lowest price. Now a decision must be made as to whether to choose him because of price or reject him because his competence is so far below the others that he would rather pay the higher price. The work sheets, therefore, are not used to make a final automatic decision but rather as an input to the decision process.

Specs Understood?

During the evaluation, the evaluators should carefully examine the plans of the bidder to assure that he has an understanding of the specifications, not just a conformity to them. He should also have a sound approach to the project, attainable schedules, and costs that are reasonable for the work.

If the request for proposal contains terms and conditions, it then becomes a very easy matter of issuing a Purchase Order referring to the request for proposal as well as the proposal itself, and then proceeding with the work.

There are many different types of contract forms which can be issued for consulting work. The most frequently used of these are based on fixed price, time and materials or on incentives. Each of these is an extremely good contract form when used correctly but can be extremely dangerous when used incorrectly.

Bruce H. Frank is director of computer and project management services for Stevenson, Jordan & Harrison Management Consultants, Inc., New York.

New Add on Core for System 360

The
lowest price
available

The new Model 3768 Storage Unit lets IBM 360 System users expand their system's memory at the lowest price available.

By utilizing the host processor and its time-proven system diagnostics for preventive maintenance as well as remedial maintenance, costly built-in test equipment has been eliminated.

The Model 3768 offers direct plug-to-plug compatibility with no complex interfacing or programming changes, available in standard IBM storage capacities including the Model 30 2.0 micro-second processor.

All CHCS memory systems are manufactured, installed and maintained by personnel thoroughly trained on IBM equipment including System 360 operation, testing, installation, and operational maintenance.

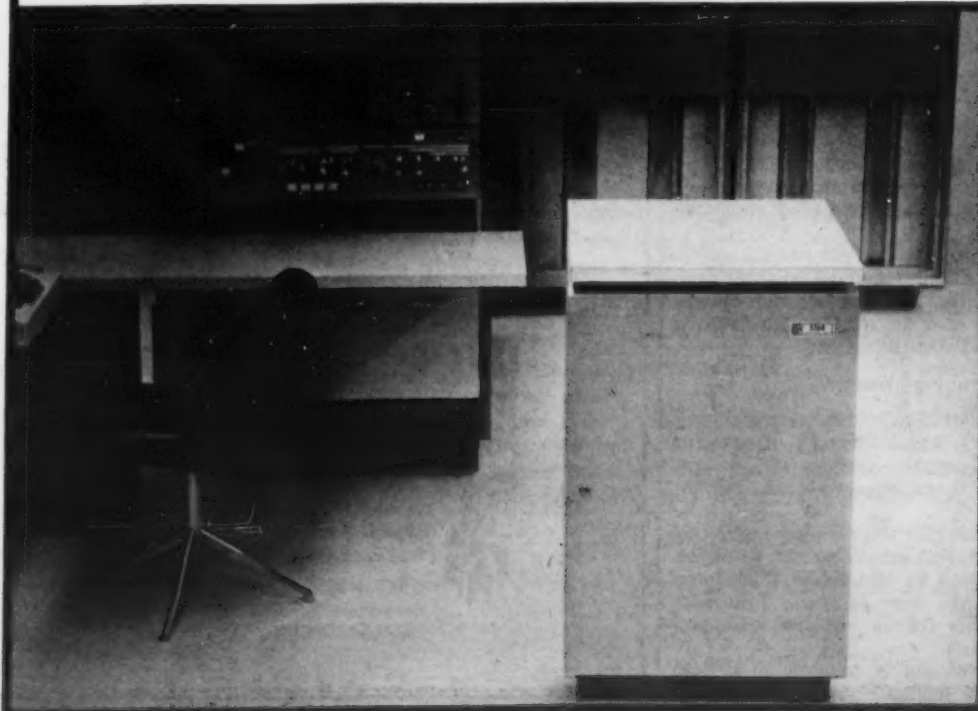
Use of CHCS memory systems will not affect your existing IBM mainframe maintenance contract.

The Model 3768 Storage Unit is available immediately for sale or lease.



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Bits and Pieces

Bigger Buffer Beefs Up 2770 Remote Batch System

WHITE PLAINS, N.Y. — IBM's 2770 data communications system has been enhanced with an additional buffer expansion feature that doubles — to 512 words — the data capacity of each buffer block, and a space compression-expansion feature that removes consecutive spaces in transmitted data and re-inserts them in received data.

The additional buffer expansion will rent for \$55/mo, and sell for \$2,420. The space compression-expansion feature will rent for \$40/mo, and sell for \$1,760. They are scheduled for customer shipment in January, 1972.

One CRT Maker Cuts Prices . . .

PENNSAUKEN, N.J. — Video Systems Corp. has reduced the price of its VST-1200 CRT data terminal from \$2,670 to \$1,795, in quantities from one to four. The terminal displays 18 lines of 72 characters. The unit's one year rental price has also been reduced, from \$99 to \$79. Video Systems is at 7300 N. Crescent Blvd., 08110.

. . . And So Does Another

GREENLAWN, N.Y. — And Hazeltine has reduced the price of its 2000 CRT terminal from \$108 to \$88 a month, effective August 1. The new price includes maintenance. Hazeltine attributed the rental decrease to the high sales of the unit. Hazeltine is in Greenlawn, New York, 11740.

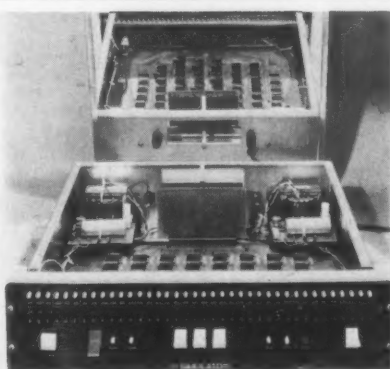
512K Offered for 360/40

MINNEAPOLIS, Minn. — A replacement core memory for the 360/40 that can expand memory size up to 512K bytes is available from Fabri-Tek. The largest memory available from IBM for the 40 is 256K.

To move from the 32K minimum on the 40 to 256K costs \$246,515 through IBM. The same move with Fabri-Tek costs \$219,000, while a move to 512K costs \$441,200. Fabri-Tek is at 5901 S. County Road 18, 55436.

Graf/pen Fits Series 16

SOUTHPORT, Conn. — Science Accessories Corp.'s Graf/pen data entry system has been interfaced to Honeywell Series 16 minicomputers. Graf/pen uses a sound emitting, ball point pen-like device for manual data entry. The new interface costs \$1,800, and is available in four to six weeks. Science Accessories is at 65 Station St., 06490.



PDP-11 Simulator Unit Permits Off-Line Hardware Debugging

CAMBRIDGE, Mass. — The 11-Simulator from Kenics Systems Corp. is a hardware replacement for the DEC PDP-11 to be used in testing and validating peripheral equipment.

By replacing the mainframe for debugging, it allows the computer to be used for software debugging, as well as preventing damage to the mainframe, and providing synched signals for oscilloscope testing.

The simulator is tied into the Unibus in the same manner as the PDP-11, and addresses, interrogates, and writes into peripheral equipment under complete manual control. The unit also checks external interrupt and direct memory access logic operation.

Instead of writing and testing a program for peripheral checkout, an engineer can get immediate response by setting switches on the simulator. Each piece of peripheral hardware can be proven before hook-up. Once the system is up, the simulator can be used for tracking down bugs.

The unit costs under \$1,000, and will be available for delivery in a month. Kenics is at 125 Harvard St., 02139.

Billing System Costs \$220/Mo

NEW YORK — An automated in-house billing system designed especially for apparel manufacturers, developed by Philips Business Systems Inc., includes a Philips P-350 office computer with a new software program for handling the specialized billing requirements of the garment industry. The total installed system will sell for \$8,995, or lease for less than \$220 per month.

The system provides pricing of styles, extensions, United Parcel Service and Parcel Post charges by zone, and insurance rate charges. All the operator does is

OCR Manufacturer's Poll Yields Checklist of Forms Design Bugs

BUFFALO, N.Y. — OCR forms design is complex, but all too often it is one of the last subjects to be covered when a new OCR system is installed. And all too often forms design isn't considered deeply enough; as a result, it has become a problem area.

The forms design group at Graphic Controls Corp. conducted a survey among DP managers to determine which problems were most common and most troublesome.

A designer and manufacturer of OCR forms, Graphic Controls compiled results of the survey into the following quick checklist to guide DP managers and help them avoid the most frequent and toughest OCR forms problems.

- Margins. Minimum margin dimensions differ on practically all OCR machines. And in some cases they refer to the center of the first character rather than to its outside edge. Specifications should be double checked.

- Different Fonts. Some machines can read anything from ASASCOCR alpha to handprinted numerics, but most can't. The typewriters and the forms must match in this respect.

- Logotypes. When company names, addresses or other identification information must be included on the forms, they should be outside the read area or printed in non-read ink.

- Aspect Ratio. The ratio of the form's width to its length is critical. If it is less than 1:1, particularly with lightweight paper, it should be carefully evaluated and thoroughly tested.

- Line Spacing. All data to be scanned on the same form — and all forms processed together — must have the same line spacing. And forms should be designed to take advantage of the most efficient scan mode of the machine.

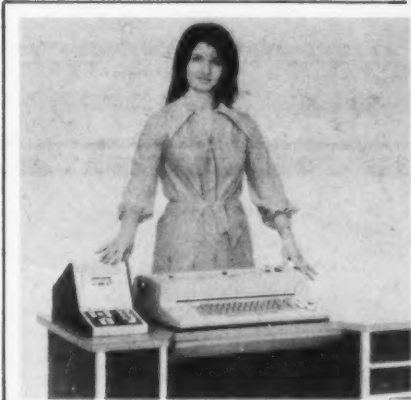
- Field Separators. These can be very useful as a means of saving machine time.

They should be preprinted on the forms where possible, but can also be typed along with data. When used with six per inch line spacing, however, some machines will not read the lines above or below a line in which a field separator has been typed.

- Locator Marks and Symbols. These are often used to establish the correct form-to-machine orientation and alignment. Some machines use horizontal lines and others use the exact position of the first characters to be read on the form. When the mark is in the scan area, make sure your forms designer checks the particular specifications of the machine.

- Typing. Guidance for typists is a major consideration in OCR forms design. Preprinted indicators for end-of-field and end-of-page are most helpful. Provisions for error correction are an absolute must. The forms designer should take an active role in training the typist.

- Form Dimensions. Short and long dimensions — both maximum and minimum — vary from machine to machine. Exact specifications must be checked with each form you use, and trim tolerances must be considered.



Emulates 2741

Trendata's Model 1500 Cassette Tape Terminal stores keyboard-entered data on Philips-type tape cassettes. The data can be checked, corrected, formatted, and stored with the terminal off-line, and then transmitted at 14.8 char/sec to a host computer.

The terminal, which leases for \$175/mo on a one-year contract, is plug-compatible with the IBM 2741, which rents for \$95 a month and is strictly an on-line, keyboard entry device. The 1500 uses an incremental recording technique that allows editing — of a character or a complete paragraph — without rewriting the tape.

Delivery is 60 days. Trendata is at 585 N. Pastoria Ave., Sunnyvale, Calif. 94086.

Q. What's 1800 lpm? A. Fast Enough

The Data Products 2470 LINE PRINTER prints up to 1800 lines a minute in a standard 132-column format. That's fast enough to qualify in most high-volume EDP installations. Print quality assured by exclusive Mark IV friction-free hammer. Cost is small enough to qualify for your budget.

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Every element of this System including the CRT display and flashing red indicator light is designed for faster input with fewer mistakes. The CRT display not only tells the operator when she makes an error, it displays the full record as she enters it. Helps avoid duplicated or omitted data.

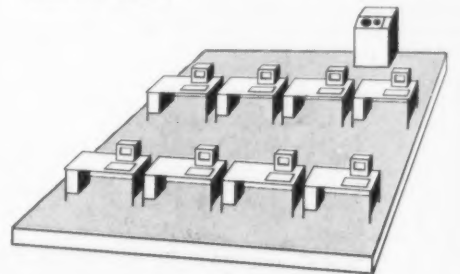
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Canada Cites 'Important DP Role'

TORONTO — The week of Sept. 12-18 has been proclaimed "Information Processing Week" by Mayor William Dennison, in recognition of "the important role the data processing profession plays in all areas of government and industry."

The week intentionally coincides with the Canadian Computer Show (an exhibition) and the annual Canadian Computer Conference (26 technical sessions), both sponsored by the Canadian Information Processing Society (Cips).

The conference will host nearly 100 speakers from Canada and the U.S. An independent panel of judges will award "best paper" prizes of \$1,000 and

Societies/ User Groups

\$250, with the aim of competition being "original developments by Canadians in the computer field," Cips said.

At the conference/show Sept.

15-17, exhibits will cover computers, peripheral equipment, software, and timesharing services. Show officials said much of the equipment will be exhibited for the first time in Canada.

A.R. Black, conference chairman, noted there are four "streams" of conference sessions, appealing to "management, technical, scientific/educational and general interests."

The Ontario Minister of Education will open the conference, officially dubbed "Session '71," and W.V. Moore, president of IBM Canada, Ltd., will deliver the keynote address.

Users, educators, and industry experts will comprise most of the speakers, and Robert ("Up the Organization") Townsend will address a morning session Sept. 16.

Also on the speaker's list is Jules Bergman, science editor of the American Broadcasting Company, who will discuss "the computer society."

The technical sessions ("Session '71") will be held in the Royal York Hotel. The exhibits will be on display at the Automotive Building, Canadian National Exhibition.

Information is available from Chairman Black at P.O. Box 343, Toronto Dominion Centre, Toronto 111, Ontario.

Afips DP Intern to China?

MONTVALE, N.J. — The Computer Internship Program sponsored by the American Federation of Information Processing Societies (Afips) will be continued for a second year, the organization has announced.

Although names and affiliations of the 1971-72 interns have not been released as yet, Afips said the five individuals had been selected.

It was expected that one of the first-year interns would study and assist in the development and application of computing technology in Taiwan.

The program consists of grants to cover transportation costs for

candidates to serve for one year at an institution or university in a nation whose computing technology is still in the developmental stage.

The program is open to graduate students, with preference given to candidates who are about to receive, or who have just received, their doctor's degrees in computing, or to those with "substantial" practical experience in the field.

Opportunities also exist, Afips noted, in Southeast Asia, the Middle East, Africa, and in Latin America.

Deadline for applications is Nov. 1. The committee is at 210 Summit Ave., 07645.

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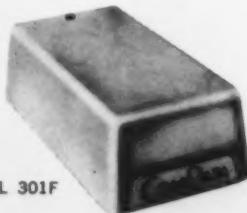
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Jerusalem Confab, Ifip '71 Near

JERUSALEM — International computer shows continue to grab the spotlight during the summer economic doldrums of the U.S. Next week is "Computer Week in Israel," so declared by the International Computer Committee of the Jerusalem Economic Conference. Aside from business meetings concerning this nation's computer development, especially in software, the Jerusalem Conference on Information Technology will take place Aug. 16-19.

The first two days of this Conference will be devoted to technical sessions, and will be highlighted by an address by Dr. Benjamin Barg, chief of the United Nations' New Technologies Section. The final two days will consist of panel discussions.

Several of the attendees of the Jerusalem conference are expected to go on to "Ifip '71," the congress and exhibition of the International Federation for Information Processing. The triennial affair is in Ljubljana, Yugoslavia, Aug. 23-28.

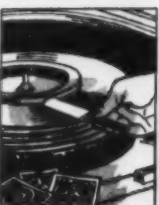
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Users Urge FCC To Block AT&T Tariff

By Ronald A. Frank

CW Technical News Editor

WASHINGTON, D.C. — AT&T's proposed interconnection requirements for voice-grade private lines has met strong opposition.

More than six organizations have told the Federal Communications Commission the latest Bell tariff filing [CW, July 28] should not go into effect as scheduled on August 15 but should be suspended pending further investigation.

In a petition to reject the AT&T plan, the Computer Time Sharing Services Section (CTSS) of Adapso said, "The introduction of new [interconnection] devices on these lines appears unreasonable."

"AT&T has introduced no studies or evidence relating to the effect of these protective

devices on the quality of service," CTSS said. The filing said AT&T had refused to disclose "any substantial information about the technical nature of these devices."

Communications

It described this as "most frightening to a user, and added that the [proposed] connecting arrangements may well cause technical problems with users' equipment."

A petition from the recently-formed Independent Data Communications Manufacturers Association Inc. (IDCMA) said the net effect of the Bell interconnection plan would be to make telephone lines not interchange-

able between Bell and non-Bell data sets.

In a similar filing the Bunker Ramo Corp. told the FCC that the interconnection plan constitutes an unwarranted and unlawful presumption of harm to all customer-provided data equipment.

Other organizations that opposed the AT&T tariff revision included Microwave Communications Inc., Western Union, the Utilities Telecommunications Council, the Computer Peripheral Manufacturers Association, and the Business Equipment Manufacturers Association.

The FCC's Common Carrier Bureau staff is currently considering the AT&T proposal.

The tariff will take effect as scheduled unless the commission votes to suspend the AT&T plan.

CTC Has Wideband Multiplexer

NEW YORK — Computer Transmission Corp. has introduced a Multitran multiplexer specifically designed to take advantage of recent tariff changes [CW, Aug. 4] for wideband data users.

An outgrowth of earlier models in the Multitran series, the wideband unit is said to handle any available data transmission rate in addition to being able to intermix varying bit speeds.

The wideband Multitran unit was introduced at the Bankers Trust credit authorization center here as being one of the first user sites to employ multiplexing techniques under changes to FCC tariff 260 that took effect July 25.

The bank processes credit inquiries over a 50 kbit/sec wideband line which connects IBM 2741 and Four Phase Systems IV-70 CRTs with a 360/65 located five miles from the authorization center. The Multitran unit operates with Bell 303 datasets.

Although an exact model designation for the wideband Multitran unit was not available (CTC is working on an all-encompassing numbering scheme), a spokesman said the device is priced from \$3,500 for a three-channel capability up to \$15,000. Available options include synchronous and asynchronous interface capability and compatibility with the CTC Optran infra-red transmission system.

CTC is at 1508 Cotner Ave., Los Angeles, 90025.

Rochester NPD Unit Said to Necessitate Certification Program

By a CW Staff Writer

ALBANY, N.Y. — The simplified interconnection device proposed by Rochester Telephone Corp. would not provide effective network protection without a program of equipment certification, according to the New York Public Service Commission (PSC).

As described at recent hearings on the proposed interconnection tariff filed with the PSC by Rochester Telephone, the Network Protective Device (NPD) does not regulate network control signaling.

It is designed only to provide protection against excessive current, voltage, and signal levels at data sites that have customer-owned and maintained (Coam) equipment, according to the PSC staff.

If the interconnection plan is approved by the PSC, Rochester Telephone will have to rely on certification and inspection of Coam devices "to safeguard the telephone network against improper control signaling, according to Richard Hesser, PSC rate analyst.

Although the NPD is not completely risk free, its protection features markedly exceed those of standard station protection apparatus used by Rochester Telephone and other phone companies, Hesser told the PSC hearing.

Current Bell System Data Access Arrangement (DAA) devices are superior to the proposed Rochester Telephone NPD unit, according to John L. Wheeler, of Xerox, a major Rochester data user.

Bell DAAs allow data users to interconnect devices that generate network control signals without the need for equipment certification, Wheeler said.

The comparison between the Bell DAA and Rochester's proposed NPD may result in testimony from the New York Telephone Co. representing the Bell System at the hearings.

If the interconnection tariff is approved, Rochester Telephone should offer both Bell DAA and the NPD connecting devices, Hesser said, with the choice being left to the customer. But the NPD would require equipment certification, he said.

Rochester Telephone should "prepare formal procedures for the certification" of Coam data equipment, Hesser suggested.

Asked to discuss the proposed interconnection rates filed by Rochester Telephone, Hesser said, "There is no basis for treating the interconnected customer differently from the noninterconnected customer." Previous witnesses at the hearings have said the Rochester plan would cost Coam subscribers more than comparable DAA rates available from Bell.

The hearings are scheduled to continue August 17 in Albany.

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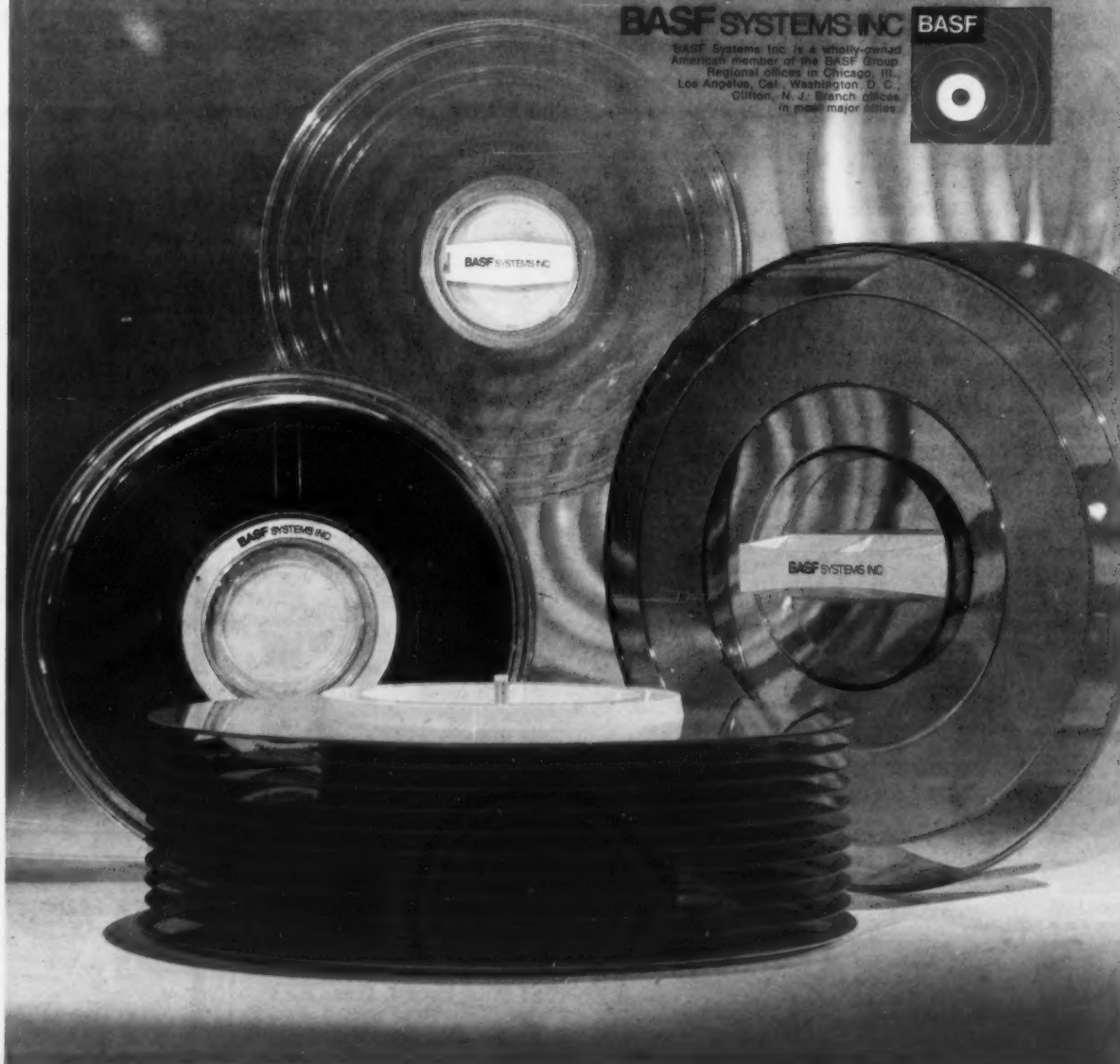
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Tape-to-Tape Data Link Smooths Cigar Orders

Special to Computerworld
NEW YORK — Consolidated Cigar Corp. now has a smoother, much milder distribution system with its recently installed order entry system.

Using on-line mag tape transmission of customer order information, the system links Consolidated's headquarters here with the firm's Fort Wayne, Ind. distribution center with a communications link.

The key equipment involved in the system is a Burroughs B 5500 installed in New York which is used with Burroughs N 7000 Magnetic Tape Encoders.

Here is how the system works:

- Customer orders are keyed to magnetic tape on the N 7000
- The resulting tape is used as high speed input to the B 5500 which processes the customer orders

- Shipping data from the processed orders is written out on magnetic tape which is then transmitted over telephone lines by the N 7000 at the home office to another N 7000 at Fort Wayne. The data received is printed out on a high speed line printer.

These printouts give the distribution center information which: tells what cigars to pick from storage; details the quantities and sizes to be shipped on each order, and notes the routing for each shipment.

According to a Consolidated Cigar spokesman, the combination of the N 7000 systems along with the location of the Fort Wayne distribution center has decreased the cigar distribution order cycle time by five to seven days.

Consolidated's Manager of Systems and Programming, George Rey, said, "We were a bit concerned about how to change stored information on tape when we first went to data encoders. Under the old punched card system, we had to punch a new

card to change information — not very fast and fairly costly. Shortly thereafter, we developed a 'record conversion' program, which allows us to change any and all fields of information by simply requesting the record number and column number. Changing information on tape now proves to be much faster and less expensive than on the card system," Rey concluded.

Frank Kluberspies, Consoli-

Applications

dated Cigar's data processing manager, said that the mag tape to mag tape link assures the fast and consistent transmission of shipping information to the warehouse point.

Previously the packing, shipping and billing instructions were subject to delays in reaching plants and warehouses by mail.

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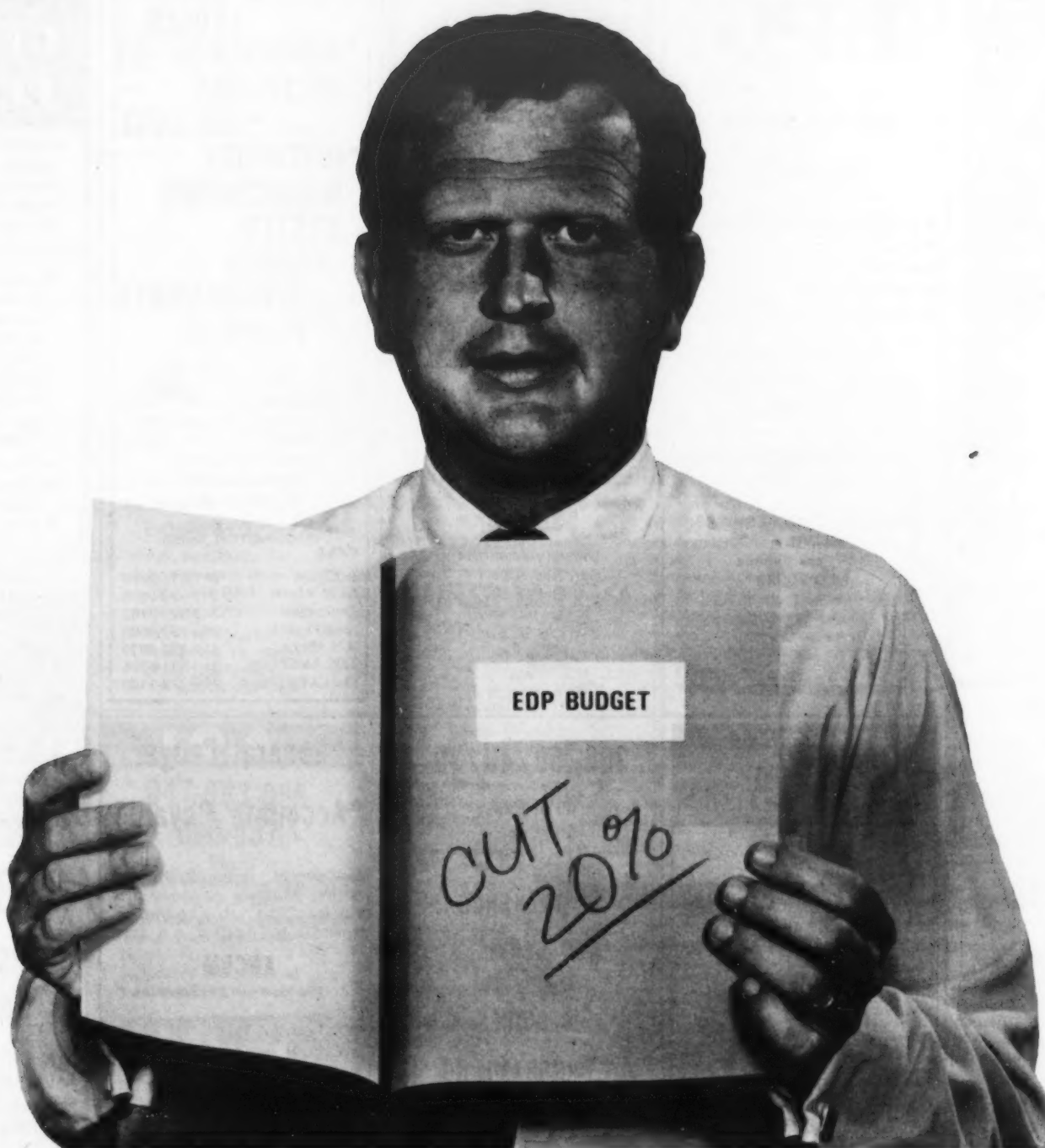
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computer industry

a Computerworld news section about the nation's fastest growing industry

August 11, 1971

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CI Notes

Sues New IBM Leases

MINEOLA, N.Y. — Potter Instruments and two of its subsidiaries here are suing IBM on antitrust grounds seeking to void IBM's new fixed-term one- and two-year leasing arrangements.

The complaint, filed in State Supreme Court, says the new options were adopted to restrain "growing competition," and are anti-competitive and monopolistic. With a new "standard denial" of the charges, IBM said the suit had "no reasonable basis."

Layoff at RCA CPU Plant

PALM BEACH GARDENS, Fla. — Citing "adjustments in production schedules," RCA has laid off 510 people at the local computer plant.

Effective Aug. 6, 400 assembly and test workers in the CPU facility were let go, and 110 more in administrative and support will leave Aug. 20.

Milestone for Memorex

SANTA CLARA, Calif. — The two-year-old Memorex Equipment Group has shipped its 10,000th disk drive, one year after shipping its first 3660.

GE Looks to New Displays

OWENSBORO, Ky. — GE has stopped making CRTs for industrial and military markets, so it can explore the "greater immediate market potential" of vacuum fluorescent, alphanumeric tubes, liquid crystals, and high density matrix displays.

PEC Cuts Transport Prices

CHATSWORTH, Calif. — An across the board price reduction of up to 25% on incremental write tape transports has been announced by Peripheral Equipment Corp. There are eight different models available for automatic test equipment, data acquisition, and format conversion applications.

Boeing Markets Fla. Package

SEATTLE, Wash. — Boeing Computer Services here has obtained a worldwide license to market a system of business programs devised by Computadata Inc., of Hollywood, Fla. Known as Casil, the software for small- and medium-sized businesses uses IBM 360 computers.

Supershorts

About every 3-1/2 hours of every working day last year, IBM received some sort of patent. Its total of 550 was more than General Motors', but less than GEs. A company spokesman said the "majority" related to DP, or to the manufacturing of DP equipment.

Since most people think of all DEC computers as mini's, and since they all aren't mini's, Digital Equipment Corp. has decided to change the public image of the PDP-10 and other large systems. Henceforth, they will be referred to as "Decsystem-10," etc.

The Viatron bankruptcy trustee goes to court Sept. 23, to "determine the insolvency" of the Bedford, Mass., company. R.R. Popeo said he might recommend a new class or classes of stock.

Half, Quarter Reports Show...

Five Firms Finding Leasing Lucrative

By Edward J. Bride

CW Staff Writer

NEW YORK — If you're looking for financial bright spots these days, take a gander at the "plus" signs on the earnings reports of some leasing companies.

In recent days, the following reports have been made public:

- Brooks International, Inc. — over \$200,000 profit after a loss last year.
- Bradford Computer & Systems, Inc. — \$847,439 profit for six months, up 50% from last year.
- Bresnahan Computer Corp., earnings

for the third quarter — \$106,000 or more than double last year's period figure, and triple the per-share earnings.

• Diebold Computer Leasing, Inc. — \$1.5 million net income for six months, almost double last year's comparable period earnings, and exactly double the per-share earnings for the same period in 1970.

Leasing, and Then Some

T.M. Brooks, president of the Texas company that bears his name, said profit improvement was caused by increased

revenues from leasing and decreased operational expenses, plus "our newly acquired enterprise," which includes electrical contracting and heavy equipment manufacturing. Fiscal year earnings were \$201,306, amortizing (and then some) Brooks' previous year's loss of more than \$190,000.

Bradford, located here on Broadway, reported income of 27 cents a share for the six months ended June 30 or revenues of \$6.6 million. In 1970, for the same period, revenues were \$2 million less with per share earnings for the half of 18 cents. Quarter revenues and earnings were up proportionately.

In Chicago, Bresnahan announced third quarter earnings of 6 cents a share, trebling last year's period earnings. The \$106,000 profit for the third quarter was based on revenues of \$1.3 million, while last year's third-quarter income of \$50,000 was based on higher income, nearly \$1.5 million.

First Half — Doubled

Back in New York, or actually at headquarters across the Hudson in Saddle Brook, N.J., Diebold president John J. Graham announced first-half earnings of 42 cents per share, double that for the same period last year.

He attributed the earnings growth to a continuing receptive climate for the company's leasing activities, a lower prime rate, high utilization of its portfolio of DP equipment at profitable rates, and earnings from expanding operations in Europe.

A fully-leased computer portfolio was also credited for an undisclosed portion of Boothe Computer Corp.'s record earnings, which were up 33% over the comparable six-month period during 1970.

Net income was \$1.8 million on revenues of \$32.5 million this year, against net of \$1.35 million on revenues of about \$21 million for the same period in 1970.

Cards Stacked Against Betting

ALBANY, N.Y. — A computer company's scheme to become the only legalized bookmaker in upstate New York was shot down by the state's Off-Track Betting (OTB) Commission. Under its plan, U.S. Data would eventually have run computerized off-track horse and numbers betting in every county in the state outside New York City, and it would have gotten 1% of all money bet.

Early this Spring, U.S. Data President Paul Costello told CW that his system was much simpler than New York City's and would be operating first. But the OTB commission noted that Costello's "system" would epitomize that of the unrestrained illegal bookmaker, with some embellishments of sophistication but little of his expertise." Costello declined comment.

The problem appears to be that Costello planned his system, then tried to find a county to approve it. Green County expressed interest, and U.S. Data submitted the proposal Feb. 22 to the OTB Commission. The commission pointed out that the proposal "alluded to a non-existent Green County Off Track Pari-Mutuel Betting Commission," and

the Green County legislature set one up April 9.

Then it was noticed that the Commission's power and duties had not been defined, and this was done by the legislature May 14. But the state Commission noted in its report that it is not clear that the county commission "has any awareness of the details of the plan of operation previously submitted by U.S. Data in its behalf."

U.S. Data had other problems, too. According to the report, plans by U.S. Data to tie its computers directly to those at Belmont and Aqueduct racetracks were labeled "infeasible" by the New York Racing Association, which runs the tracks.

Further, numbers games are "entirely outside the scope of the law," the report noted.

The State Commission was particularly concerned that participating counties would have virtually no control over U.S. Data. Officials would have "limited, if any, access" to the data center, the report said. "The only semblance of public or other supervision of the center... is a nonexistent 'public benefit corporation'."

IBM Price Change Analysis

Sales, Near-Term Profit Aided by Boost

By Michael Merritt

CW Staff Writer

The July price increases of IBM are attempts to hypo short-term profits while maintaining long-term profits — a neat trick if it can be done.

The essentials of the changes are a 4% increase on 360 CPU-rentals and a 20% increase on their maintenance, plus an 8% increase in rental and purchase rates on 370 CPUs. The 6% rental and purchase increase on S/3 Mod 10, and the readjustment — mostly upwards — of maintenance rates on a number of pieces of peripheral gear should not have much impact on users or on IBM's sales.

In the short term, it may well provide just the shot in the arm IBM needs. Although increased rentals will provide a marginal increase in income at best, outright sales are the best and surest way to increase earnings, especially if the partially or completely amortized 360s are being sold.

Any increase in leases on peripheral gear, brought about by lower prices through the new fixed-terms, will lock users into IBM, since they are not likely to run a Honeywell or an RCA mainframe with IBM peripherals. Thus, the more

attractive lease arrangements help solidify that IBM "bank" of leasing customers.

After a good many users had signed up for a one- or two-year hitch, IBM then told them that CPU prices were going up. Users are going to have an overall saving of a few percent, so there probably won't be much resentment, even though the timing does seem contrived.

Short-Term Affects

For the next 12 to 24 months, then, IBM will profit from either increased and rock-steady 360 rental, or from fatter 370 rental and 360 sales, or, as a sort of booby prize, from termination charges.

As for long-term growth, IBM is obviously basing its plans on the 370. There is an obstacle here, though, since IBM is living off its existing customer base; the 370s are replacing the 360s, sometimes at a net loss of income for the Giant.

If you have a captive customer base, however, and an army of hungry salesmen, have lowered prices substantially only two months previous, and have not raised prices for several inflationary years, you can probably push the 370 without too much trouble.

If you sell the 360s you replace, you

eventually end up ahead.

For the really long term, over two years out, there is no indication yet of any IBM plan, other than trusting the economy will improve, making conditions better for pushing the more profitable 370.

IBM is still relying on the 360 "bank," increased 370 rentals indicate that. But the need to bolster profits immediately has forced IBM to add another bow to its quiver, and become more flexible in the face of adversity.

Adversity at IBM?

This is 1971: there's still a recession. IBM salesmen are running at 10% to 12% of quota, according to some rumors, and the Colossus couldn't come up with a quarterly increase in profit in its latest statement — the first time since the purchase bulge (of 360s from the leasing companies) skewed the curves in 1969.

Chairman T.V. Learson even predicted poor showings for the rest of 1971 [CW, July 21].

Attributing the price boosts to increased business costs, IBM is not unreasonable in adjusting for inflation. Where, how and when the adjustment took place is another story.

ADR Cites 80% Lease Renewals

PRINCETON, N.J. — Applied Data Research, Inc. said recently that 80% of the leases of its proprietary documentation program are being renewed.

Named Autoflow, the patented program is in use in more than 1,600 DP installations. The program was sold initially to help programmers debug and document computer programs.

Newly discovered uses for the program, ADR said, have accounted for the high renewal rate. The company is preparing an Autoflow handbook for describing other uses of the system, including system and program design, coding and desk checking, education, maintenance and conversion.

Available to first-time users on a three-year basis, leases are renewed annually thereafter. Under contract agreements, new features and enhancements are furnished to customers.

U.S. Market Guide Lists Data Firms

By a CW Staff Writer

WASHINGTON, D.C. — A guide to non-technical sources of information in the business machines industry, with special emphasis on EDP, has been compiled by a branch of the U.S. Department of Commerce.

Commerce is making the directory available for 50 cents a copy. The Business Machine Market Information Services Directory contains references to information sources in the Department of Commerce, U.S. and foreign trade media, professional organizations, market research reports, and production and trade statistics.

The directory was prepared by the Bureau of Domestic Commerce, business and scientific equipment division. Copies are available from Sales and Distribution, NTIS, U.S. Department of Commerce, 20230.

Metric Conversion? Change Can Help Industry

CW Washington Bureau

WASHINGTON, D.C. — The computer industry could well reap a financial bonanza if Congress approves the recommendation of the Department of Commerce for a systematic, nationally coordinated U.S. changeover to the metric system of measurement over a 10-year period.

According to the 188-page report, "A Metric America — A Decision Whose Time Has Come," submitted to Congress, "Computers have already reduced drastically much of the drudgery that would be involved in translating one measurement language to another."

'Change in Program'

"Numerically controlled machine tools... are guided by a kind of computer program. Guidance to metric

dimensions needs only a change in the program."

According to Daniel V. De Simone, metric study director and author of the report, computers "will do much to ease the change" to the metric system.

The report is the result of three years of studies, surveys and analyses by the National Bureau of Standards, a unit of Commerce. Congress had requested the study in 1968.

Few Opposed

In coming up with the report, the input of thousands of individuals and scores of professional organizations and groups was evaluated; there were relatively few negative responses.

The Department of Defense did say that "computer programs for data systems will have to be revised. For example, tactical data systems operating an entity will require simultaneous conversion of all units if they are to retain their usefulness."

The Business Equipment Manufacturers Association said its members "are concerned about the present multi-dimensional environment and would prefer a single system of units of measure."

Acquisitions

Systems Engineering Laboratories, Inc., Ft. Lauderdale, Fla., has finalized the agreement reached with National Micro-netics Inc., W. Hurley, N.Y., regarding the sale of its controlling interest in Systems' San Diego-based disk memory subsidiary to an employee group. The new name of the unit will be Pacific Micronetics Inc.

Executive Data Systems has acquired Gamut Systems, Inc., Livingston, N.J., from Management Data Corp., Philadelphia. Gamut provides facilities management and other services to hospitals.

Motek Corp., Valley Forge, Pa., has purchased the Scan Systems and Quick Punch Divisions of Scanforms, Inc. Scan Systems provides DP services; Quick Punch offers keypunch services.

United Data Centers has acquired Nashville Computer Services, Inc. for an undisclosed amount of cash.

Central Data Systems has completed the acquisition of Pittsburgh Computer Co.

Computer Learning and Systems Corp. has purchased the National Institute of Computer Professions for \$75,000 from Delta Automated Systems. The institute teaches computer programming to English and Spanish speaking students; Delta will retain the Spanish portion.

Electro-Data Inc. and Care Electronics Inc., Huntsville, Ala., have reached an agreement by which a newly formed subsidiary will acquire "substantially all" of the assets and liabilities of Care, subject to approval by Care stockholders.

Information Interscience Inc. (3i) has agreed in principle to acquire Information Co. of America (ICA) for an undisclosed amount of stock.

Wingate Computing Center, Providence, R.I., has agreed to purchase the East Hartford, Conn., data center plant of Travcom, Inc., headquartered in Cincinnati, Ohio. Wingate will be designated as Travcom's marketing agent in the New England area for its on-line DP service.

Infodata Systems Inc. has acquired the Broadcast Computer Services Division of Wolverine Broadcasting Corp. BCS provides a proprietary software system to radio stations and networks.

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Varian	Nixdorf (Germany)
NCR	Olivetti (Italy)
Collins	Marconi (Scotland)
H-P	ICL (England)
Bell Telephone	Honeywell-Bull (France)
IT & T	AEG-Telefunken (Germany)
Univac	English Electric (England)
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**Peter Denning
joined ACM for technical information
and contacts.**

**Now he's involving
other members
in everything from
microprogramming
to data banks
and privacy.**

Peter Denning, 29, is an Assistant Professor of Electrical Engineering at Princeton. He's also an ACM member and chairman of our committee on special interest groups and committees (SIGs/SICs). He wasn't always as active in ACM.

"I joined in 1965 while working on my thesis," says Peter. "Mainly for technical material and a chance to meet other computer professionals. In 1968, I was asked to edit the Operating Systems (SIGOPS) newsletter. I got involved and quickly

took on more responsibility. After two leadership positions, I ran for SIG/SIC chairman.

"Special interest groups are what ACM is all about," says Peter. "We've got 27 now, from microprogramming techniques to the impact of computers on society. One out of three ACM members belong to at least one group. I want this share to grow.

"Now I can do something about it. Like help restructure the whole SIG/SIC operation. Some groups may

have to be split up, to cover less ground. Others need stronger leadership. A few we should have don't even exist yet, like performance evaluation and computer architecture."

Peter Denning is involved in ACM, the oldest and most respected association in the computer field. He's advancing his career. Sharing his ideas. And making a contribution to the computer profession.

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Switching, Not Fighting Japan Wins in Unbundling

By Bohdan O. Szuprowicz

Special to Computerworld

MANILA, Philippines — June 14 was IBM Unbundling Day here.

System/3 installations and all new product installations from now on will be unbundled. Installed 360 systems will be available to present users under existing conditions until 1973, when all IBM systems will be unbundled.

But this IBM move has not upset the Philippine users very much, because new and interesting bundled opportunities are appearing on the scene, due primarily to a very aggressive Japanese effort to penetrate the market.

In fact, this appears to be the first country where the Japanese have scored significantly while competing with long-established American manufacturers.

Some cost-conscious Philippine computer users tried for some time to get IBM to allow shift-time averaging over several months, in determining the final rental for their systems.

Their pleas went without success as far as IBM goes so they turned to those manufacturers who allow unlimited shift time, free reprogramming and availability of higher language compilers such as Cobol.

Spearheading the Japanese effort and providing all the goodies is Fujitsu Ltd. with its Facom line of business and scientific computers. There are now five known Facom installations in the Philippines, or close to 5% of all the installations in the country.

What is particularly significant is the speed with which the market penetration was done since Fujitsu installed its first machine only two years ago, and competes against U.S. manufacturers who have been selling here for more than 10 years.

Software support, better hardware and training are all plus factors from U.S. manufacturers. But the Japanese war reparations debt, coupled with recent monetary restrictions limiting dollar pur-

chases and the IBM unbundling announcement, literally give the market to the Japanese manufacturers.

The war reparations debt comes to about \$350 million the Japanese must pay through 1975. In commercial dealings these reparations may take the form of direct grants, 20 year loans or shorter term loans at interest as low as 3%. The Japanese manufacturers, obviously with the fullest support of their all pervasive Miti (Ministry for International Trade and Industry) are taking advantage of the situation to introduce their computers as well as other equipment to the Philippine market.

A Facom 230-25 is replacing an IBM 1401 at the Bureau of Internal Revenue and the Philippine government also chose to install two Facom 230-25 systems as the core of the National Computer Center. These are shortly expected to be upgraded to Facom 230-45 systems.

Elsewhere two other Facom 230-25 systems are installed at two leading insurance companies that originally did data processing on IBM equipment through their own service bureau. The service bureau, one of the largest operations in the country also is considered the largest programming and software operation in the Philippines and may become a representative agency for Fujitsu.

This suggestion is strengthened by the enthusiasm for the Fujitsu computer line by Frank A. Rea, vice-president of Special Services Corp. He believes, to sell effectively, a manufacturer must have installed and working equipment in a country like the Philippines. Many American manufacturers fail to do that when they try to penetrate the market with a resulting poor share, he maintains.

While all Fujitsu machines are purchased, the users were offered all reprogramming from their previous systems, in most cases IBM 360. Fujitsu in fact brought its own programmers to Manila to complete the job on site.

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Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.
The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

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All Not Bleak in Software Firms

By Edward J. Bride

CW Staff Writer

ROCKVILLE, Md. — All is not bleak in the software industry, according to three recent financial reports which nonetheless caution that the recession is not over, either.

Comress, the developers or

marketers of Scert, Dynaprobe, and Amigos, announced the highest first half revenue and operating profit in its nine year history.

Informatics Inc., of Canoga Park, Calif., experienced a smaller profit, attributed by President Walter F. Bauer to losses sustained at the Los Angeles data center, which has since been discontinued.

Applied Data Research, Inc. (ADR), developers of one of the most successful proprietary software programs, cut its net loss to 32 cents a share for the first half versus 37 cents last year.

At Comress, Fred C. Ihrer, president, said Scert, Dynaprobe and Amigos were the company's largest revenue producers, but other product lines "have now reached the point where they too are contributing substantially to overall profitability."

Ihrer anticipates "significant" deliveries of the computer monitor Dynaprobe during the third quarter, while Amigos (a file access method replacing IBM software) has experienced a

quarterly growth rate of 100% since its introduction a year ago.

Comress revenue for the half was \$2.7 million, with net earnings of \$459,000. The company lost money for the same period last year.

At Informatics, the first quarter results showed net income of \$48,000, three cents per share, on revenues a little over \$5 million. Last year's totals were \$56,000, four cents per share, on \$4.7 million.

Contracts with the government and with General Foods Corp., plus continued success of the Mark IV File Management System, were also reported.

John R. Bennett, president of ADR, called his first-half results "disappointing," adding his company had initiated "vigorous cost reduction programs" to improve the operating posture for the balance of the year.

ADR lost \$310,062 on revenues of \$3,336,401. The net and revenue were better than last year, when ADR reported a loss of \$354,330 on revenues \$3,276,394.

New Fraud Suit Against Memorex

SANTA CLARA, Calif. — Just as Memorex was settling one complaint over its lease arrangements with its leasing subsidiary, another complaint cropped up from two stockholders.

The firm signed a consent decree with the Federal Government, enjoining Memorex from violating securities regulations, although it admitted no wrongdoing at the time.

Then, Joseph and Ruth Berke filed a class action against the firm, charging security act violations (much as the Securities and Exchange Commission had done) and seeking undetermined damages.

The original suit charged the company with issuing misleading earnings reports. Memorex changed accounting in compliance with the SEC, and said it agreed to the consent judgment "to avoid the cost and inconvenience of needless litigation."

In the Berke suit, Memorex said it has "meritorious defenses to the complaint and these defenses will prevail in any litigation which may ensue."

Nickels & Dimes

Sterling quarter results, relatively speaking, have been announced by Sterling Computer Systems, which operates DP centers in Texas, California, and Oklahoma. Net profit of \$77,651 was 4 cents

per share, about twice that for the same period last year, despite slightly lower revenues for 1971.

President T.E. Holdsworth said increased orders for the first quarter just ended should result in an increase of both revenue and profits during the remainder of the year.

\$\$\$

University Computing Co. said its facilities management subsidiary, Computer Technology Inc., operated profitably in both the second quarter and first half of 1971, after losses in the same period last year.

Parent UCC itself reported net income of \$1,645,000, or 22 cents per share, for the last quarter, and \$3.1 million, or 42 cents per share, for the half. President Charles J. Wyly, Jr., reiterated earlier predictions that UCC would be profitable for each quarter of 1971, and for the year as a whole.

\$\$\$

Burroughs declared another quarterly dividend, a regular occurrence uninterrupted for the last 76 years. The 15 cent payout will be made Oct. 20 to shareholders of record Sept. 24.

\$\$\$

Effective cost performance by EDP service and business forms manufacturing teams are sharing credit for higher profits at Reynolds & Reynolds Co., of Dayton.

\$\$\$

Computer Investors Group, Inc., upped previous projections of about 20% revenue gains, saying IBM price increases could add at least an additional 5%. The company is engaged in marketing and financing computer equipment, primarily through leasing.

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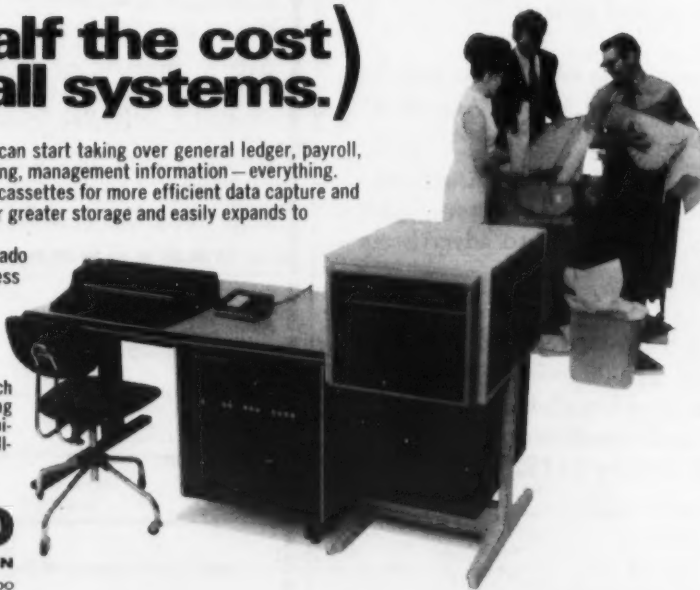
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Computerworld Stock Trading Summary

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CLOSING PRICES THURSDAY, AUGUST 5, 1971

E X C H	PRICE			
	1971 RANGE (1)	CLOSE AUG 5 1971	WEEK NET CHNGE	WEEK PCT CHNGE

SOFTWARE & EDP SERVICES

O ADVANCED COMP TECH	1-4	1 1/2	0	0.0
A APPLIED DATA RES.	5-13	5 7/8	-1/4	-4.0
O APPLIED LOGIC	1-3	7/8	+1/8	+16.6
O ARIES	1-2	1	-1/8	-11.1
N AUTOMATIC DATA PROC	44-65	53 1/4	-7	-11.6
O AUTO SCIENCES	4-8	4 3/8	+1/8	+2.9

O BOOTHE DATA SYS	1-2	1	0	0.0
O BRANDON APPLIED SYS	1-1	1/2	-1/8	-20.0
O COMPUTER ENVIRON	1-2	3/4	0	0.0
O COMPUTER NETWORK	2-11	4 1/4	-1/4	-5.5
O COMPUTER PROPERTY	5-11	5 1/2	-1/4	-8.3
N COMPUTER SCIENCES	9-17	9 1/4	-1	-9.7

O COMPUTER TASK GROUP	1-3	1 3/4	-1/4	-12.5
O COMPUTER USAGE	5-16	7 3/8	-5/8	-7.8
O COMP AUTOMOT REPORTS	6-13	10 1/2	-5/8	-5.6
N COMPUTING & SOFTWARE	27-45	28 1/2	-7/8	-2.9
O COMPRESS	2-4	2 1/4	0	0.0
O COMSHARE	4-8	4 3/8	-1/4	-5.4

O CONSOL. ANAL. CENT.	1-2	1	-1/8	-11.1
O DATA AUTOMATION	1-4	3 3/8	0	0.0
O DATA PACKAGING	6-10	8 3/8	-1/4	-2.8
O DATAMATION SERVICE	1-3	1	0	0.0
L DATATAB	4-10	6 3/4	-1/4	-3.5
O DIGITEK	1-4	1 1/8	-1/8	-10.0

O EDP RESOURCES	7-16	8	+1/4	+3.2
A ELECT COMP PROG	3-7	3 1/8	-1/4	-7.4
N ELECTRONIC DATA SYS.	53-85	53 1/8	-1 1/4	-2.2
O INFORMATICS	7-15	9 1/4	-1/2	-5.1
A ITTEL	12-23	11 5/8	-1/8	-1.0
O KEANE ASSOCIATES	5-14	6 1/4	+1/4	+4.1

O KEYDATA CORP	8-14	7 3/4	-3/4	-8.8
A MANAGEMENT DATA	8-11	7 3/4	-1	-11.4
O NATIONAL CSS INC	7-14	8	0	0.0
O NAT COMP ANALYSTS	1-4	1 1/8	-1/8	-10.0
O NAT. COMP. SERV.	1-4	7/8	-3/4	-66.1
N PLANNING RESEARCH	16-26	17 3/4	-1/8	-0.6

O PROGRAMMING METHODS	18-29	22 1/2	-1 1/2	-6.2
O PROGRAMMING & SYS	2-4	2 1/8	0	0.0
L PROGRAMMING SCIENCES	1-3	1/8	0	0.0
O SCIENTIFIC COMPUTERS	2-3	2 1/4	-1/8	-5.2
O SCIENTIFIC RESOURCES	1-2	3/4	0	0.0
O SOFTWARE SYSTEMS	1-2	1 3/8	0	0.0

O TRS COMPUTER CENTERS	4-9	4 1/4	-3/8	-8.3
O TOLLEY INTL CORP	3-8	6 3/4	+1/4	+3.9
O UNITED DATA CENTER	2-7	3 1/8	0	0.0
N UNIVERSITY COMPUTING	21-38	24 5/8	-1	-3.0
A URS SYSTEMS	7-11	7	+3/8	+5.6
O U.S. TIME SHARING	1-3	7/8	0	0.0

O VORTEX CORP	2-5	2 1/2	+1/2	+25.0
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PERIPHERALS & SUBSYSTEMS

N ADDRESSOGRAPH-MULT	24-48	33 5/8	-2 3/8	-6.5
O ALPHANUMERIC	2-6	1 7/8	-1/8	-6.2
N APEX CORP	18-25	14 1/8	-2 3/8	-14.3
O ASTRODATA	1-2	1	-1/4	-20.0
O ATLANTIC TECHNOLOGY	3-8	5 1/4	-3/8	-6.6
A BOLT, BERANEK & NEI	5-8	5 1/8	0	0.0

N BUNKER-RADIO	10-17	9 7/8	-3/8	-3.6
A CALCOMP	19-33	19	+1/4	+1.3
O COGNITRONICS	3-9	3 1/4	-3/8	-10.3
O COLORADO INSTRUMENTS	2-8	2 1/4	-1/4	-10.0
O COMPUTER COMMUN.	6-19	7 1/8	-1 1/8	-13.6
A COMPUTER EQUIPMENT	4-7	4	0	0.0

A COMPUTEST	8-20	8 1/4	+3/8	+4.7
O CONSOL COMPUTER LTD.	8-12	7 7/8	-1 3/4	-18.1
A DATA PRODUCTS CORP	5-10	5 1/4	-7/8	-14.2
O DATA TECHNOLOGY	3-9	4 3/8	-1/8	-2.7
O DIGITRONICS	4-8	5	-1/8	-2.4
N ELECTRONIC M & M	8-16	10	-3/8	-3.6

O FARRI-TEK	2-4	2 3/8	0	0.0
O FARRINGTON MFG	1-3	3/8	+1/8	+50.0
O FOTO-MEY INC	1-6	1 1/4	+1/4	+25.0
O INFOTEX INC	28-49	28	-5	-15.1
O INFORMATION DISPLAYS	5-8	5	-3/8	-6.9
O MANAGEMENT ASSIST	1-2	5/8	-1/8	-16.6

A MARSHALL INDUSTRIES	14-27	14 7/8	0	0.0
A MILGO ELECTRONICS	14-26	13 3/4	-5/8	-4.3
N MOHAWK DATA SCI	22-47	22 1/4	-3 3/8	-13.1
O ON LINE SYSTEMS INC	7-18	10 1/4	-3/4	-6.8
O OPTICAL SCANNING	10-18	9 1/2	-3/4	-7.5
O PHOTON	7-12	8	+1	+14.2

O PHOTO-MAGNETIC SYS.	1-6	1 3/4	-1/4	-12.5
A POTTER INSTRUMENT	14-25	14 1/8	-1/4	-1.7
O PRECISION INST.	7-16	9 1/2	-1 1/2	-13.6
O RECOGNITION EQUIP	12-26	12 3/8	-1 3/4	-12.3
O RECOR CORP.	5-8	5	+1/4	+5.2
N SANDERS ASSOCIATES	11-22	12 1/4	+1 5/8	+15.2

O SCAN DATA	6-15	9 1/2	-1/2	-5.0
O TALLY CORP.	8-16	8 3/8	+1/4	+3.0
M TFLX	13-22	13 1/8	0	0.0
O VIATRON	1-4	7/8	-3/8	-30.0

SUPPLIES & ACCESSORIES

N ADAMS-MILLIS CORP	12-19	17	-1/8	-1.0
O BALTIMORE BUS FORMS	6-10	8	-1/4	-3.0
A BARRY WRIGHT	8-13	7 3/4	-1/4	-3.1
A DATA DOCUMENTS	16-29	17 1/2	+3/4	+4.4
O DUPLEX PRODUCTS INC	8-10	9	0	0.0
N ENNIS BUS. FORMS	8-13	8 3/8	+1/4	+3.0

O GRAHAM MAGNETICS	9-35	19 3/4	-2 3/4	-12.2
O GRAPHIC CONTROLS	6-15	9 7/8	-7/8	-8.1
N MEMOREX	27-78	28 3/4	+3/4	+2.6

E X C H	PRICE			
	1971 RANGE (1)	CLOSE AUG 5 1971	WEEK NET CHNGE	WEEK PCT CHNGE

N 3M COMPANY	96-122	112 7/8	-2 5/8	-2.2
O MOORE BUS. FORMS	37-42	37 1/2	-2 5/8	-6.5
N NASHUA CORP	29-47	40	-1	-2.4
O REYNOLDS & REYNOLD	37-58	55 1/4	-1	-1.7
O STANDARD REGISTER	18-23	18 1/8	0	0.0
O TAR PRODUCTS CO	8-17	14 3/4	-1/2	-3.2
N UARCO	25-34	28 3/4	-2	-6.5
A WABASH MAGNETICS	7-10	6 5/8	-3/8	-5.3
N WALLACE BUS FORMS	18-26	21 3/8	-1	-4.4

COMPUTER SYSTEMS

N BURROUGHS CORP	105-138	118	+1/2	+0.4
N COLLINS RADIO	12-20	13 5/8	+1	+7.9
N CONTROL DATA CORP	48-83	50 3/4	-2 1/2	-4.6
O DATA GENERAL CORP	19-50	43 1/4	-1 3/8	-3.0
N DIGITAL EQUIPMENT	53-85	69	+2	+2.9
N ELECTRONIC ASSOC.	5-9	6	-1/4	-4.0

A ELECTRONIC ENGINEER.	5-9	7 3/8	-5/8	-7.8
N FOXROD	25-46	38 7/8	+1	+2.6
O GENERAL AUTOMATION	9-26	9	-1 3/4	-16.2
N GENERAL ELECTRIC	53-124	54 7/8	+1 3/4	+3.2
N HEWLETT-PACKARD CO	30-45	37 7/8	+1 1/8	+3.0
N HONEYWELL INC	83-115	93 3/8	-1/2	-0.5

N IBM	287-344	287	-9 3/4	-3.2
O INTERDATA INC	6-11	7 1/2	-3/4	-9.0
N NCR	38-49	37 3/4	-1 5/8	-4.4
N RCA	26-41	31 1/8	+1/8	+0.4
RAYTHEON CO	27-46	34 3/4	+1 3/8	+4.1
O SCI. CONTROL CORP.	1-2	3/4	0	0.0

N SPERRY RAND	25-38	26 3/8	-1 1/2	-5.3
A SYSTEMS ENG. LABS	8-18	8 5/8	-1 1/8	-11.5
N VARIAN ASSOCIATES	13-18	13	+1/8	+0.9
N VICTOR COMPTOMETER	14-27	13 7/8	-2 1/8	-13.2
N WANG LABS.	29-50	38	-2 3/4	-6.7
N XEROX CORP	85-119	108 1/8	-5 3/2	-4.7

LEASING COMPANIES

A BOOTHE COMPUTER	13-27	17	+3/4	+4.6
O BRESNAHAN COMP.	2-4	3	0	0.0
O COMPUTER EXCHANGE	3-9	3	-1	-25.0
A COMPUTER INVSTRS GRP	8-14	10 1/8	-1/4	-2.4
N DATA PROC. F & G	11-19	12 1/4	-1 1/8	-8.4
O DATRONIC RENTAL	2-4	2 1/4	-1/8	-5.2

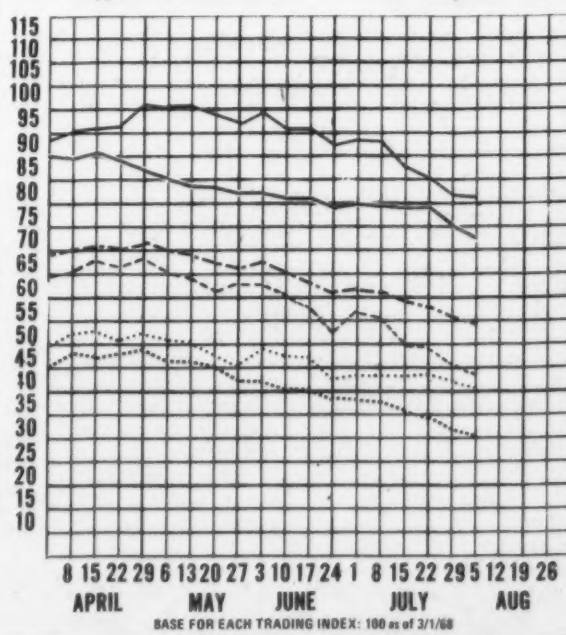
A DEARBORN-STORM	24-44	32 1/4	-5	-13.4
A DIEROLD COMP. LEAS.	5-13	8 1/4	-1/4	-2.9
A DPA, INC.	4-8	6 3/4	-3/8	-5.2
A GRANITE MGT	7-13	7	+3/8	+5.6
A GREYHOUND COMPUTER	7-11	7 3/8	-1	-11.9
N LEASCO CORP	16-23	19 3/4	-1/8	-0.6

O LECTRO MGT INC	2-5	2 1/4	-1/4	-10.0
A LEVIN-THOMSEND CMP	5-9	5 1/2	+1/8	+2.3
O LMC DATA, INC.	1-1	5/8	0	0.0
O MCC INDUSTRIE S	3-8	6 3/4	-3/8	-5.2
O SYSTEMS CAPITAL	3-7	5 5/8	-3/8	-6.2
N U.S. LEASING	16-30	25 1/8	+7/8	+3.5

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

Computer Systems Software & EDP Services
Peripherals & Subsystems Leasing Companies
Supplies & Accessories CW Composite Index



Earnings Reports

COMPUTER INVESTORS

	1971	1970
Shr Ernd	\$5.19	\$1.14
Revenue	2,803,120	2,410,550
Spec Cred	b36,000
Earnings	c436,970	285,824

a-Based on income before special credit. b-From repurchase of a portion of the company's debentures. c-Equal to 21 cents a share.

TEKTRONIX

	1971	1970
Shr Ernd	\$1.15	\$1.76
Revenue	145,999,000	165,205,000
Earnings	9,329,000	14,254,000

NETWORK DATA

	1971	1970
Shr Ernd	\$0.39	\$2.24
Revenue	1,745,904	1,251,732
Earnings	250,021	148,083

CLARY

	1971	1970
Shr Ernd	\$0.07
Revenue	2,823,000	\$2,544,000
Earnings	(Loss)	95,000 (451,000)
6 Mo Shr	a.08
Revenue	4,762,000	4,562,000
Spec Cred	b809,000
Earnings	(Loss)	c911,000 (721,000)

a-Based on income before special credit. b-From sale of certain product lines and realization of future income on royalty contracts. c-Equal to 63 cents a share.

BARRY WRIGHT

	1971	1970
Shr Ernd	\$0.10	\$0.18
Revenue	6,936,638	7,450,887
Earnings	168,490	312,192
6 Mo Shr	.15	

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